KD11-A

CPU DIAG

MD-11-DQBEA-B

EP-DQBEA-B-DL-A

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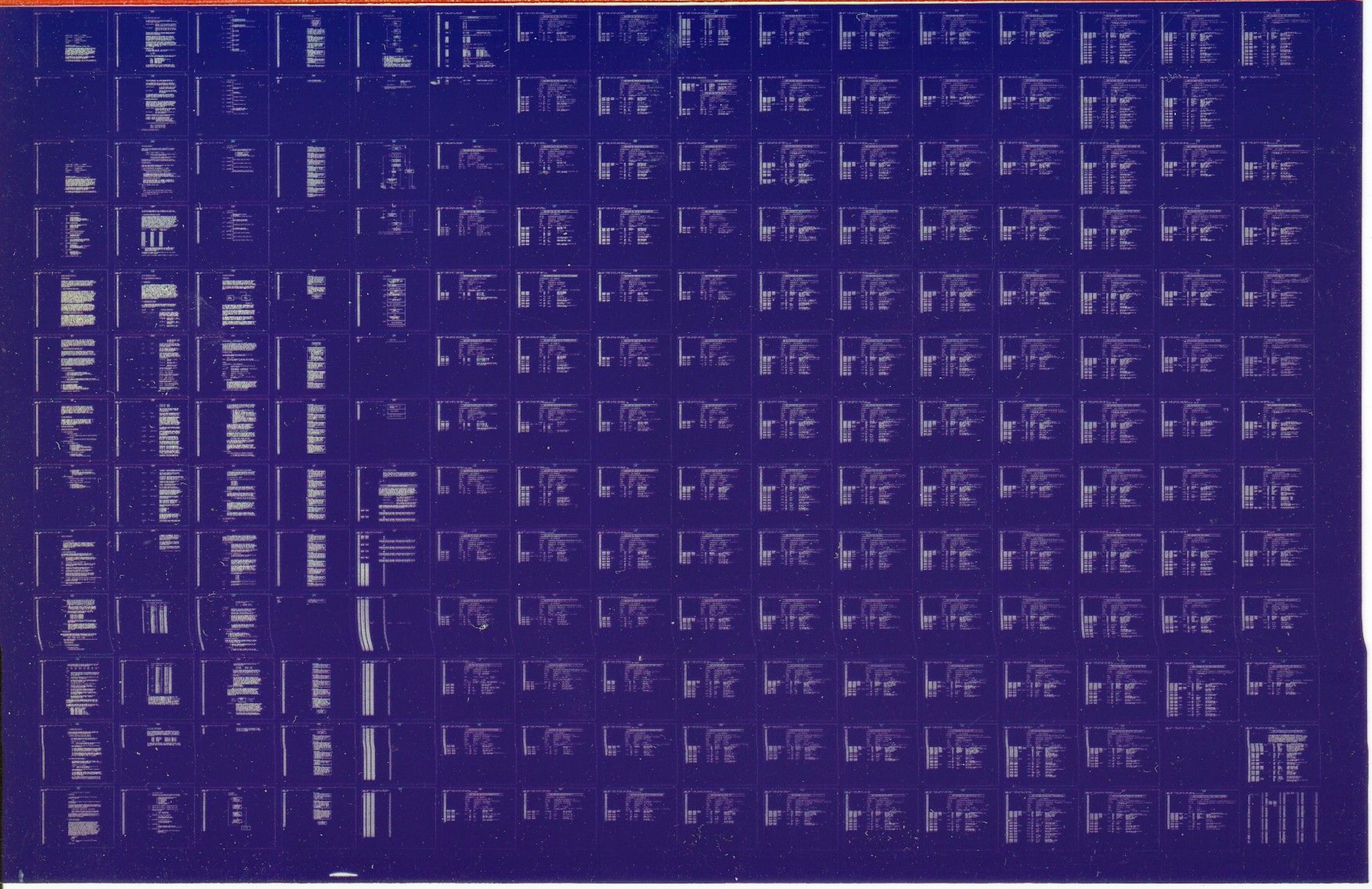

KD11-A

11/40 CPU TEST

MD-11-DBQEA-B

EP-DBQEA-B-DL-A

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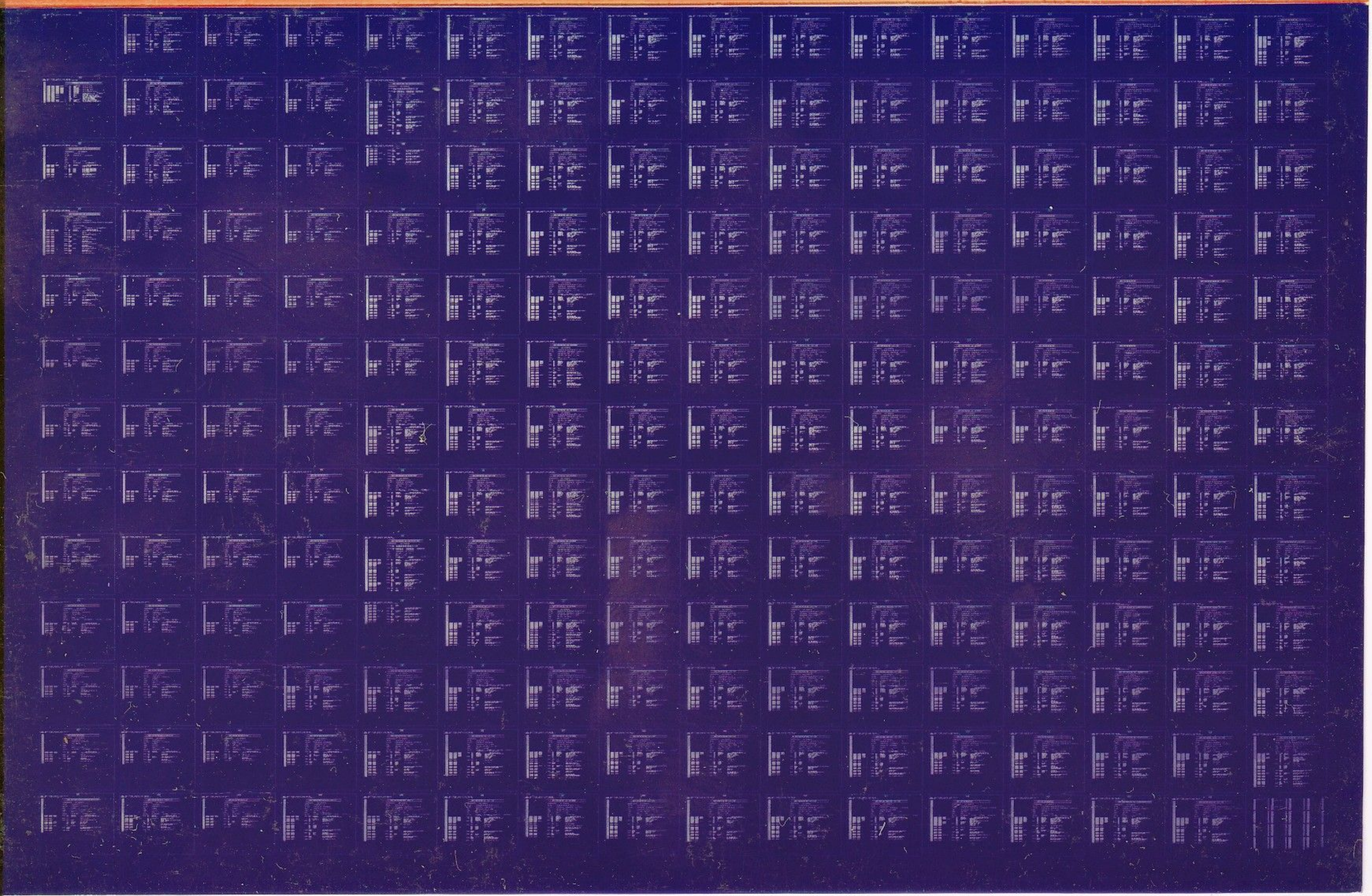

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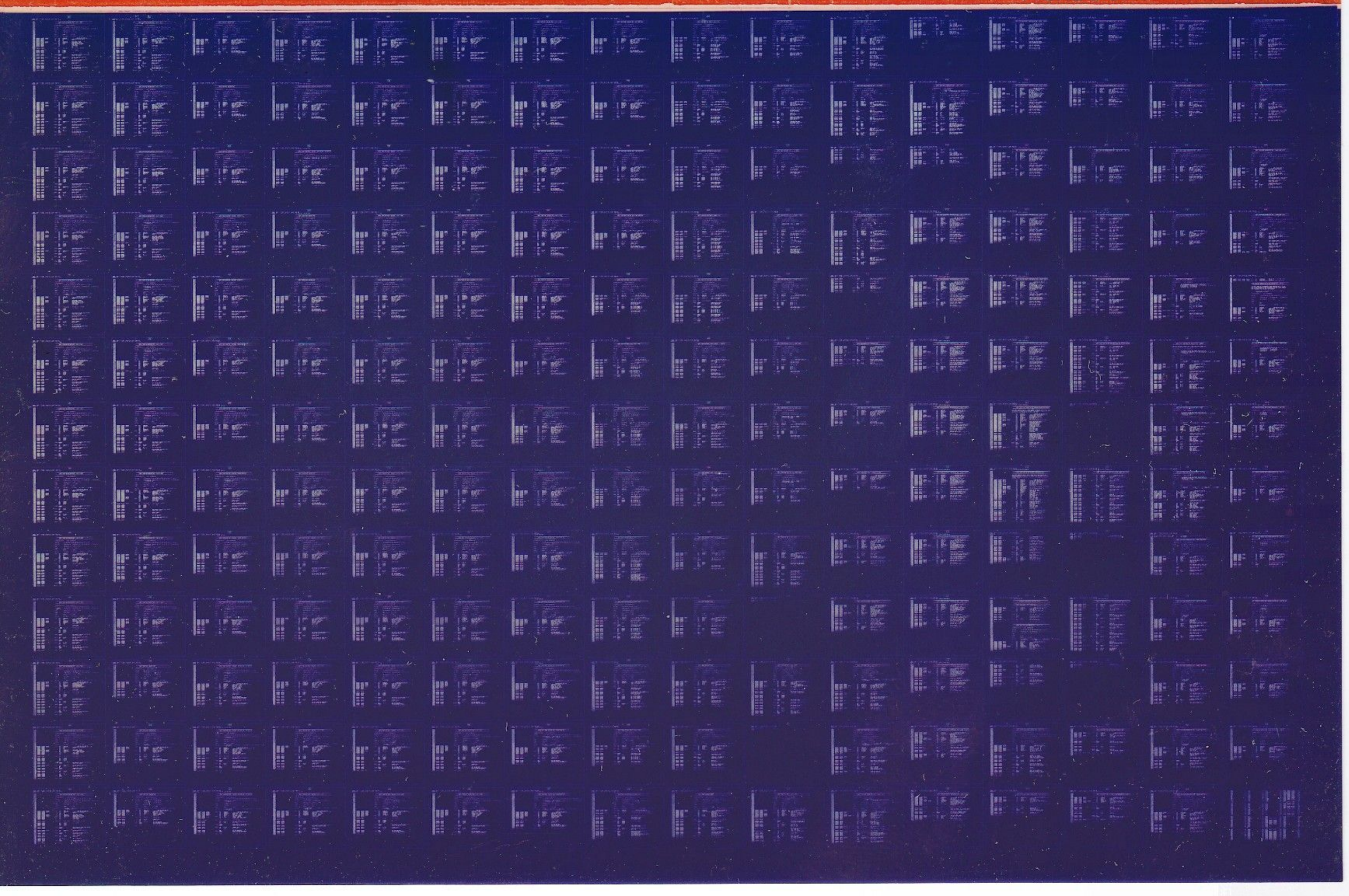

KD11-A

11/40 CPU TEST

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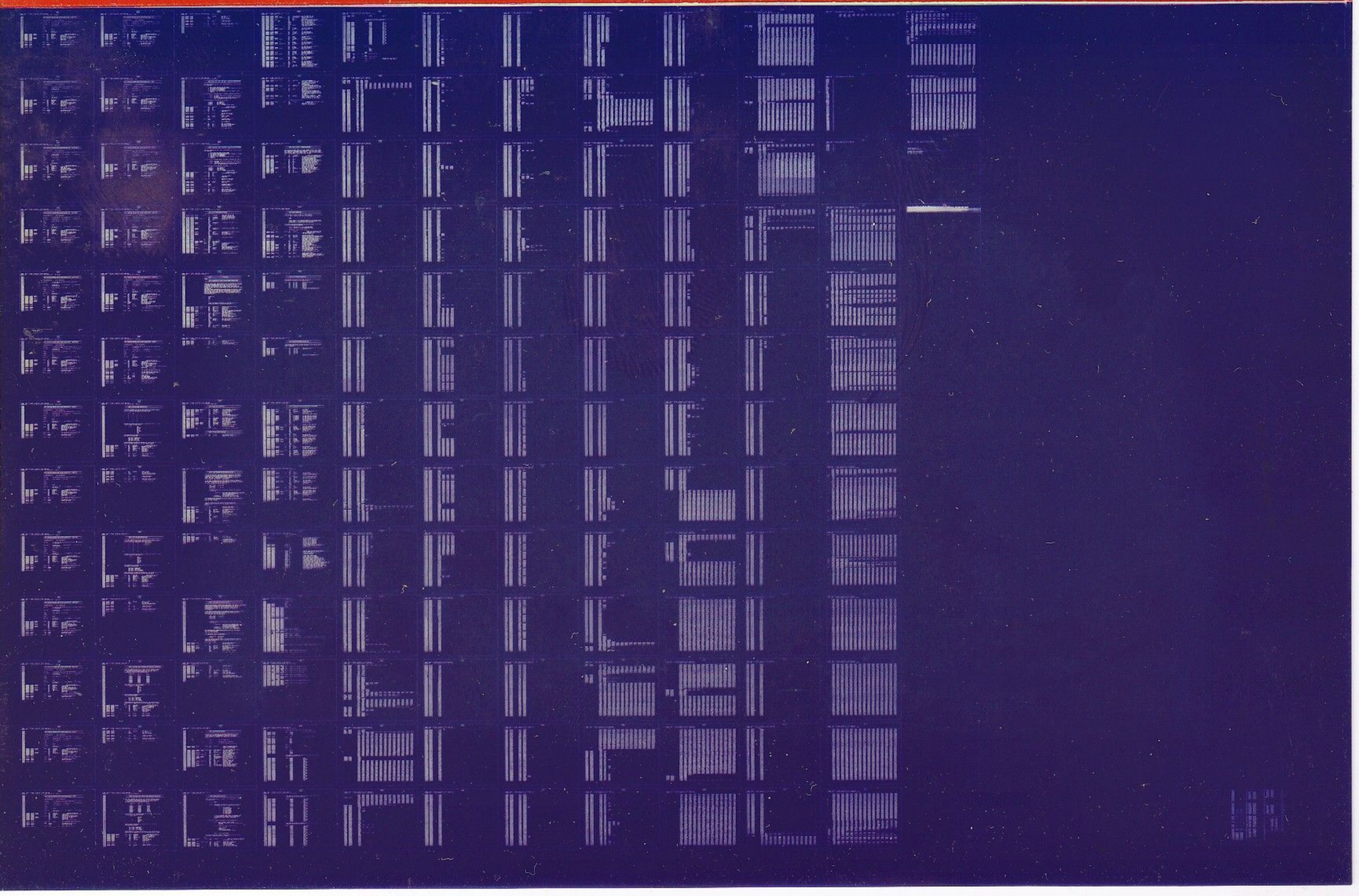

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PRODUCT CODE: MAINDEC - 11 - DBQEA-B

PRODUCT NAME: KD11-A CPU DIAGNOSTIC (PDP11/40)

DATE: 21-AUGUST-1975

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: E. CROWLEY

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PRODUCT CODE: MAINDEC - 11 - DBQEA-B
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1.0 GENERAL PROGRAM INFORMATION

1.1 PROGRAM PURPOSE

"DBQEAB" IS A DIAGNOSTIC PROGRAM DESIGNED TO DETECT, REPORT, AND IDENTIFY LOGIC FAULTS IN THE KD11-A CENTRAL PROCESSING UNIT OF THE PDP11/40 SYSTEM. IT CONSISTS OF 525(10) INDIVIDUAL TESTS CAREFULLY DESIGNED AND SEQUENCED TO DETECT AND ATTEMPT TO IDENTIFY LOGIC FAULTS AT A MINIMUM HARDWARE/SOFTWARE LEVEL. THESE TESTS ARE PARTITIONED INTO THREE MAJOR SECTIONS AS DESCRIBED BELOW:

A. BASIC INSTRUCTION TESTS (BIT)

THIS SECTION CONSISTS OF A LOGICALLY SEQUENCED SET OF BASIC INSTRUCTION TESTS DESIGNED TO VERIFY THE INTEGRITY OF THOSE INSTRUCTIONS AND LOGIC OPERATIONS USED BY THE UTILITY ROUTINES THAT PROVIDE ERROR LOGGING AND SCOPE LOOPING FACILITIES FOR THE SUBSEQUENT TWO MAJOR SECTIONS. NO UTILITY IS CALLED UNTIL ITS INSTRUCTION COMPLEMENT HAS BEEN VERIFIED. THIS SCHEME ACCOMPLISHES TWO IMPORTANT MAINTENANCE OBJECTIVES: 1)IT MINIMIZES THE POSSIBILITY OF THE ERROR REPORTING ROUTINES CONVEYING AMBIGUOUS ERROR INFORMATION TO THE USER, AND 2)IT MAXIMIZES THE POSSIBILITY THAT THE ERROR WILL BE DETECTED BY A ROUTINE DESIGNED TO IDENTIFY FAILING OPERATIONS RATHER THAN HAVE THE ERROR MANIFEST ITSELF IN A MORE COMPLEX UTILITY ROUTINE THAT IS NOT STRUCTURED TO DIAGNOSE FAULTS.

ANY FAULT DETECTED IN THIS SECTION CAUSES THE PROGRAM TO "HALT" WITH THE CONSOLE ADDRESS AND DATA DISPLAYS INDICATING THE FAILING TEST. ADDITIONAL FAULT IDENTIFICATION INFORMATION IS AVAILABLE IN THE PROCESSOR'S GENERAL REGISTERS, PSW, STACK, AND PROGRAM ANNOTATION FOR THE FAILING TEST. A LOCK ON HARD ERROR FEATURE IS EMPLOYED TO PREVENT THE PROGRAM FROM CONTINUING ON ONCE A SOLID ERROR IS DETECTED. DEPRESSING CONTINUE AFTER THE ERROR HALT CAUSES A RETRY OF THE FAILING TEST

B. COMPREHENSIVE INSTRUCTION TESTS (CIT)

THIS SECTION, COMPRISED OF THE BULK OF THE TESTS, CONSISTS OF A LOGICALLY SEQUENCED AND PARTITIONED SET OF INSTRUCTION TESTS DESIGNED TO TEST AND VERIFY ALL THE MICROINSTRUCTION SEQUENCES AND DATA PATH DATA MANIPULATIONS IMPLICIT IN THE DESIGN SPECIFICATION OF THE KD11-A MICROPROGRAM. ALL LOGIC SEQUENCES, THAT CAN BE ACTIVATED IN THE PROGRAM "RUN" MODE ARE TESTED WITH THE EXCEPTION OF THE SMALL AMOUNT OF LOGIC THAT REQUIRES AN ACTIVE "DMA" DEVICE. THIS EXCLUDES THOSE SEQUENCES AND LOGIC FUNCTIONS THAT SUPPORT THE CONSOLE FUNCTIONS (LOAD ADDRESS, DEPOSIT, ETC.). EACH TEST IN THIS SECTION CALLS A "SCOPE LOOP" UTILITY THAT FACILITATES USER CONTROL OF TEST SELECTION AND EXECUTION VIA THE CONSOLE SWITCH REGISTER.

UPON DETECTION OF A LOGIC FAULT, EACH TEST IN THIS SECTION CALLS AN "ERROR SERVICE" ROUTINE THAT LOGS THE ERROR AND REPORTS IT AS HARD COPY ON THE CONSOLE TERMINAL DEVICE. THE ERROR SERVICE ROUTINE ALSO FACILITATES USER CONTROL OF THE PROGRAM SEQUENCE VIA CONSOLE SWITCH REGISTER OPTIONS. AFTER REPORTING THE ERROR THE PROGRAM CONTINUES ON IN ITS NORMAL SEQUENCE UNLESS MODIFIED BY THE USER ACTIVATING THE "LOCK ON HARD ERROR" SWITCH OPTION.

C. COMBINED INSTRUCTION EXERCISER (IEX)

THIS SECTION CONSISTS OF A MORE COMPLEX SET OF INSTRUCTION TESTS DESIGNED TO TEST THE INSTRUCTIONS WHEN USED IN VARIOUS COMBINATIONS MANIPULATING VARIABLE DATA PATTERNS. LIKE THE PREVIOUS SECTION, IT CALLS THE "ERROR SERVICE" AND "SCOPE LOOP" UTILITIES TO REPORT ERRORS AND ALLOW USER CONTROL OF TEST EXECUTION.

WHERE AT ALL POSSIBLE THE PROGRAM ANNOTATION ATTEMPTS TO CALL OUT THE MOST PROBABLE FAILURE TO THE FUNCTIONAL LOGIC AREA. EACH TEST OR GROUP OF GENERIC TESTS INCLUDES MICROPROGRAMMING AND LOGIC INFORMATION TO FACILITATE FURTHER ISOLATION OF THE FAULTY COMPONENT THRU THE USE OF ADDITIONAL LOWER LEVEL CHECKS BY THE MAINTENANCE TECHNICIAN USING THE KM-11 MAINTENANCE MODULE OR OSCILLOSCOPE. DETAILED PROCEDURES FOR USING THIS MAINTENANCE INFORMATION IS INCLUDED IN PARA. 6.0.

1.2 SYSTEM REQUIREMENTS

A. HARDWARE REQUIREMENTS

1. PDP11/40 CPU WITH OPERATOR'S CONSOLE
2. 16K OF CORE STORAGE - MF11/U OR EQUIVALENT
3. DL11 ASYNCHRONOUS LINE INTERFACE WITH TERMINAL
4. KW11-L LINE CLOCK (OPTIONAL)

B. SOFTWARE REQUIREMENTS

1. PDP11 ABSOLUTE LOADER PROGRAM FOR PAPER TAPE SYSTEMS
2. XXDP MONITOR FOR DECTAPE,MAGTAPE,CASSETTE, OR DISK SYSTEMS.

1.3 RELATED DOCUMENTS AND STANDARDS

A. PDP11/40 PROCESSOR HANDBOOK
B. PDP11 PERIPHERALS HANDBOOK
C. KD11-A PROCESSOR MAINTENANCE MANUAL
D. PDP11/40 SYSTEM ENGINEERING DRAWINGS
E. DIAGNOSTIC ENGINEERING STANDARDS AND CONVENTIONS PROGRAMMING PRACTICES - DOC NO. 175-003-009-00

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

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"DBQEAB" ASSUMES THAT THE HARDCORE VERIFIED BY THE "BCPT" (RESIDENT BASIC CPU TEST FOR 1080 SYSTEMS) IS OPERATIONAL. A COPY OF THE "BCPT" TEST IS INCLUDED AS PART OF THE LOAD MODULE AND IS RESIDENT IN CORE STARTING AT LOCATION 1000(8) WHENEVER "DBQEAB" IS LOADED. AUTOMATIC LINKAGE TO THE START OF "DBQEAB" OCCURS IF "BCPT" RUNS ERROR FREE. THIS PROVIDES THE USER WITH THE OPTION OF RUNNING "BCPT" PRIOR TO EXECUTING "DBQEAB" IF HE SUSPECTS A FAULT IN THE "HARD CORE".

1.5 FAILURE ASSUMPTIONS

"DBQEAB" ASSUMES THAT THE STORAGE MEDIUM USED TO STORE THE PROGRAM IS INTACT AND THAT IT CAN BE LOADED INTO CORE. IT ALSO ASSUMES THAT THE BASIC TESTS DESCRIBED IN PARA. 1.4 RUN ERROR FREE AND ANY ASSUMPTIONS MADE BY THESE TESTS IS VALID. (REFER TO MAINDEC-10-DFQMAA FOR A DESCRIPTION OF THE 1080 RESIDENT TESTS)

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURES

A. LOADING PROCEDURES

1) PAPER TAPE SYSTEMS

USE THE STANDARD PDP11 ABSOLUTE LOADER PROCEDURES.

2) XXDP SYSTEMS

USE THE STANDARD XXDP MONITOR LOADING PROCEDURES.

B. STARTING PROCEDURES

1. TO RUN "DBQEAB" ONLY

A) SET SR = 000200
B) DEPRESS LOAD ADDRESS
C) SET SR = 000000 (NO SWITCH OPTIONS)
D) SET HALT/ENABLE IN THE ENABLE POSITION
E) DEPRESS START
F) REFER TO PARA. 3.0 AND 4.0 FOR NORMAL PROGRAM RESPONSES AND ERROR REPORTS.

2. TO RUN "BCPT" PRIOR TO "DBQEAB"

A) SET THE SR = 1000
B) DEPRESS LOAD ADDRESS
C) SET SR = 000000 (NO SWITCH OPTIONS)

D) SET HALT/ENABLE IN THE ENABLE POSITION
E) DEPRESS START
F) REFER TO PARA. 3.0 AND 4.0 FOR NORMAL PROGRAM RESPONSES AND ERROR REPORTS OR TO THE "BCPT" DOCUMENT IF AN ERROR HALT OCCURS IN THE BCPT SECTION.

C. RESTART PROCEDURES

1. TO INITIALIZE "PASCNT","ERRCNT", AND "PFCNT" TO ZERO

SAME AS IN 2.1(B1) ABOVE

2. TO PRESERVE "PASCNT","ERRCNT", AND "PFCNT"

A) SET SR=003034
B) DEPRESS LOAD ADDRESS
C) SET SR=000000 (NO OPTIONS)
D) SET HALT/ENABLE TO ENABLE POSITION
E) DEPRESS START SWITCH

2.2 SPECIAL ENVIRONMENTS

A. 16K PDP11/40 SYSTEMS

FOR 16K SYSTEMS USING THE "XXDP" PACKAGE YOU WILL BE UNABLE TO USE THE "UPDATE" PROGRAMS TO LOAD,SAVE, UPDATE ETC. SINCE THE SIZE OF "DBQEAB" WILL NOT PERMIT SIMULTANEOUS RESIDENCY OF THE UPDATE PROGRAMS. SUFFICIENT FREE CORE IS AVAILABLE FOR THE "XXDP" MONITOR SO THAT "DBQEAB" CAN BE LOADED BY THE MONITOR.

2.3 PROGRAM OPTIONS

A. SWITCH REGISTER OPTIONS

THE FOLLOWING CONSOLE SWITCH REGISTER OPTIONS ARE ACTIVE UPON ENTERING THE COMPREHENSIVE INSTRUCTION TESTS (CIT) SECTION: (SWITCH OPTION IS ACTIVE WHEN SW IS SET TO A "1")

SW15 HALT ON ERROR. IF ERROR PRINTING IS ENABLED THE HALT OCCURS AFTER THE PRINTOUT. DEPRESSING "CONTINUE" CAUSES THE PROGRAM TO PROCEED ON IN NORMAL SEQUENCE FROM THE POINT OF ERROR.

SW14 CONTINUOUSLY LOOP ON THE CURRENT TEST

SW13 INHIBIT NORMAL ERROR PRINTOUTS - THIS DOES NOT INCLUDE POWER FAIL, BUS ERROR, RSVD INSTR TRAPS, ∂R MISSED TEST PRINTOUTS.

SW12 INHIBIT ALL PRINTOUTS NOT COVERED UNDER SW13. THIS INCLUDES I.D., OPTIONS FOUND, ENDPAS, ETC.

SW11 INHIBIT SUB-TEST ITERATIONS. TEST ITERATIONS ARE AUTOMATICALLY INHIBITED ON THE FIRST PASS.

SW10 SEARCH FOR AND CONTINUOUSLY LOOP ON THE TEST NUMBER SELECTED BY THE CONTENTS OF SW<09:00>. ONLY USE THIS OPTION FOR TESTS T0145 THRU T1015 SINCE THE "SCOPE" UTILITY IS NOT ACTIVE UNTIL TEST T0145.

SW09 IF SW10=0 , SW09=1 WILL ACTIVATE THE "LOCK ON HARD ERROR" FEATURE.

IF SW10=1, SW09 BECOMES THE HIGH ORDER BIT IN THE TEST NUMBER TO BE SELECTED.

SW<9:0> USED TO SELECT A PARTICULAR TEST FOR LOOPING IF SW10=1 THERE IS NO TEST 000 DEFINED.

B. MEMORY LOCATIONS

1. FILLS: THERE IS A LOCATION TAGGED "FILLS" THAT IS USED TO SPECIFY THE FILL COUNT AND FILL CHARACTER FOR THOSE TERMINAL DEVICES REQUIRING THE USE OF FILLERS. THE HIGH BYTE CONTAINS THE FILL COUNT AND THE LOW BYTE CONTAINS THE FILLER CHARACTER. IT IS PROGRAM LOADED AS A 002400(8) TO SPECIFY FIVE NULL CHARACTERS.

2. ITCOUNT: THERE IS A LOCATION TAGGED "ITCOUNT" THAT CONTAINS THE ITERATION COUNT TO BE USED ON PASSES SUBSEQUENT TO PASS 0 TO SPECIFY THE NO. OF SUB-TEST ITERATIONS IT IS PROGRAM LOADED TO SPECIFY 32.(10) ITERATIONS.

3. OPTION: THERE IS A LOCATION TAGGED "OPTION" THAT IS SET UP AUTOMATICALLY BY THE PROGRAM TO INDICATE THE PDP11/40 INTERNAL OPTIONS FOUND:

BIT15=1 KW11-L INSTALLED
BIT07=1 KT11-D INSTALLED
BIT02=1 KJ11-A INSTALLED
BIT01=1 KE11-F INSTALLED
BIT00=1 KE11-E INSTALLED

THE PROGRAM USES THE BITS IN "OPTION" TO SKIP THOSE TESTS THAT ARE OPTION DEPENDENT TO PREVENT REDUNDANT ERROR REPORTS.

4. BPTLOC: THERE IS A LOCATION TAGGED "BPTLOC" THAT PROVIDES THE USER THE MECHANISM FOR SETTING SIXTEEN "BREAKPOINT HALTS" THROUGHOUT THE PROGRAM. THIS ENABLES RAPIDLY "HOMING IN" ON THE FAILING TEST IN THOSE CASES WHERE THE FAULT CAUSES A RUNAWAY OR HUNG PROGRAM. REFER TO PARA. 4.2 FOR A DETAILED DESCRIPTION OF THE USE OF THIS FEATURE.

2.4 EXECUTION TIMES

ONE COMPLETE ERROR FREE PASS OF DBQEAA WITH NO TEST ITERATIONS SHOULD TAKE LESS THAN 5 SECONDS. A SUCCESSFUL PASS WILL BE INDICATED BY THE FOLLOWING PRINTOUT ON THE CONSOLE DEVICE:

PASCNT = 000001 ERRCNT = 000000

WITH ITERATIONS ENABLED A COMPLETE ERROR FREE PASS SHOULD TAKE LESS THAN 2 MINUTES.

3.0 ERROR INFORMATION

3.1 ERROR REPORTING PROCEDURES

A. ERROR MESSAGE FORMATS

1. STANDARD ERROR MESSAGE HEADER

```
                        THE FOLLOWING HEADER IS PRINTED ON DETECTION OF THE FIRST
                        ERROR DETECTED AFTER THE BASIC INSTRUCTION TEST SECTION.
                        IT IS ONLY PRINTED ONCE PER PROGRAM PASS.

                      (PC)   (PS)    (SP)   (TEST)   (IR)   DEST    WAS    S/B
                      (R7)   (PSW)   (R6)    (R0)    (R1)   (R2)   (R3)   (R4)

                      WHERE:

                      (PC)    INDICATES THE CONTENTS OF THE PROGRAM COUNTER AT THE
                              TIME OF THE ERROR CALL. THIS IS NORMALLY AN ADDRESS
                              THAT IS USED TO LOCATE THE ERROR CALL STATEMENT IN
                              THE FAILING TEST.

                      (PSW)   INDICATES THE CONTENTS OF THE PROCESSOR STATUS WORD
                              AT THE TIME OF THE ERROR CALL

                      (SP)    INDICATES THE CONTENTS OF THE STACK POINTER (R6) AT
                              THE TIME OF THE ERROR. (NOTE THAT THE ERROR CALL
                              WILL PUSH THE STACK TWICE)

                      (R0)    INDICATES THE TEST NO. (IN OCTAL) THAT FAILED

                      (R1)    CONTAINS A COPY OF THE TEST INSTRUCTION
                              THIS WILL BE THE FIRST WORD IN THE CASE OF TWO
                              OR THREE WORD INSTRUCTIONS.

                      (R2)    FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R2
                              NORMALLY CONTAINS THE DESTINATION ADDRESS

                      (R3)    FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R3
                              CONTAINS WHAT THE RESULT (DEST. OPERAND) ACTUALLY
                              WAS AFTER THE TEST.

                      (R4)    FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R4
                              CONTAINS WHAT THE RESULT (DEST. OPERAND)
                              SHOULD HAVE BEEN (S/B).

                      IN SOME CASES THE ERROR INFORMATION MAY DEVIATE FROM THAT
                      DESCRIBED ABOVE BUT THE PROGRAM ANNOTATION FOR THOSE TESTS
                      WILL DESCRIBE THE MEANING OF THOSE ENTRIES THAT HAVE BEEN
                      RE-DEFINED.

                      THE ERROR CALL STATEMENT MAY BE ENCODED TO PRINT ONLY THE
                      INFORMATION RELATIVE TO THE PARTICULAR FUNCTION BEING TESTED.
                      INTERPRETATION OF THE ERROR CALLS IS AS FOLLOWS:

                              ERROR   PRINTS ALL 8 COLUMNS
                              ERROR1  PRINT ONLY COLUMN 1
                              ERROR2  PRINT COLUMNS 1,2
                              ERROR3  PRINT COLUMNS 1,2,3
                              ERROR4  PRINT COLUMNS 1,2,3,4
                              ERROR5  PRINT COLUMNS 1,2,3,4,5
                              ERROR6  PRINT COLUMNS 1,2,3,4,5,6
                              ERROR7  PRINT COLUMNS 1,2,3,4,5,6,7
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2. STANDARD ERROR PRINTOUT

A LINE OF FROM ONE TO EIGHT SIX DIGIT OCTAL NUMBERS THAT LINE UP UNDER THE APPROPRIATE HEADER ENTRY AND HAVE THE MEANINGS DESCRIBED IN THE PREVIOUS SECTION.

3. RESERVED INSTRUCTION TRAP ERROR MESSAGE

ANY RESERVED INSTRUCTION TRAP DETECTED AFTER THE BASIC TESTS RESULTS IN THE FOLLOWING PRINTOUT:

TRAPPED TO 10 PC = XXXXXX

WHERE: XXXXXX IS THE CONTENTS OF THE PROGRAM COUNTER AT THE TIME THE TRAP WAS SPRUNG.

AFTER REPORTING THE ERROR, THE PROGRAM IS RESTARTED FROM THE BEGINNING.

IF A RSVD INSTRUCTION TRAP OCCURS WHILE IN THE PROCESS OF TRYING TO SERVICE A PREVIOUS RSVD INSTRUCTION TRAP OR A BUS ERROR TRAP THE PROGRAM HALTS. A DESCRIPTION OF THIS HALT IS CONTAINED IN PARA. 3.1 B4 BELOW.

IF A RSVD INSTRUCTION TRAP OCCURS PRIOR TO COMPLETION OF THE BASIC INSTRUCTION TEST SECTION THE PROGRAM WILL HALT VIA A TRAPCATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT IS DESCRIBED IN PARA. 3.1,B2 BELOW.

4. BUS ERROR TRAP ERROR MESSAGE

ANY UNEXPECTED BUS ERROR TRAPS (BUS TIMEOUT, ODD ADDRESS ERROR, ILLEGAL INSTRUCTION, OR STACK OVERFLOW) RESULTS IN THE FOLLOWING PRINTOUT:

TRAPPED TO 4 PC = XXXXXX

WHERE: XXXXXX IS THE CONTENTS OF THE PC AT THE TIME THE TRAP WAS SPRUNG.

AFTER REPORTING THE ERROR THE PROGRAM IS RESTARTED FROM THE BEGINNING.

IF A BUS ERROR TRAP OCCURS WHILE A PREVIOUS BUS ERROR OR RSVD INSTRUCTION IS STILL PENDING THE PROGRAM WILL HALT. A DESCRIPTION OF THE HALT INTERPRETATION IS GIVEN IN PARA. 3.1,B4 BELOW.

IF A BUS ERROR OCCURS PRIOR TO THE COMPLETION OF THE BASIC INSTRUCTION TESTS, THE PROGRAM WILL HALT VIA A TRAPCATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT

IS INCLUDED IN PARA. 3.1,B2 BELOW.

5. POWER FAIL

IF A POWER FAIL CONDITION IS DETECTED, THE FOLLOWING MESSAGE IS PRINTED:

POWER

AFTER PRINTING AN ATTEMPT IS MADE TO RESTART THE PROGRAM AT THE BEGINNING.

EACH POWER FAIL ENCOUNTERED DURING ANY PASS IS COUNTED IN A LOCATION TAGGED "PFCNT". DURING END OF PASS PRINTOUT THIS LOCATION IS QUERIED AND IF FOUND NON-ZERO THE NORMAL ENDPAS MESSAGE IS MODIFIED AS SHOWN BELOW:

PASCNT=XXXXXX ERRCNT=YYYYYY PFCNT=ZZZZZZ

WHERE "ZZZZZZ" GIVES THE TOTAL COUNT OF THE POWER FAILS (IN OCTAL) OCCURRING DURING ANY PROGRAM RUN.

IF THE POWER FAIL IS DETECTED BEFORE COMPLETION OF THE BASIC INSTRUCTION TESTS, THE PROGRAM WILL HALT VIA A TRAP CATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT IS GIVEN IN PARA. 3.1,B2 BELOW.

6. MISSED TEST MESSAGE

THERE IS A 512 BYTE TABLE TAGGED "STAB1" THAT CONTAINS A BYTE ENTRY THAT CORRESPONDS TO EACH SEQUENTIAL TEST NO.. AFTER THE "MOVB #N,X(R)" INSTRUCTION HAS BEEN VERIFIED IN THE "BIT" SECTION, EACH TEST WILL USE THIS INSTRUCTION TO SET THE BYTE THAT CORRESPONDS TO THAT TEST NO. TO ALL ONES (377) THROUGHOUT THE REMAINDER OF THE "BASIC INSTRUCTION TESTS" SECTION. DURING THE "CIT" AND "IEX" SECTIONS THE TABLE ENTRIES ARE UPDATED BY THE "SCOPE" LOOP UTILITY. DURING END OF PASS SERVICE, A CHECK ROUTINE IS CALLED TO SCAN THE TABLE AND INSURE THAT EACH BYTE IS SET TO ALL ONES (377). ANY ENTRY THAT STILL CONTAINS ZEROES (TABLE IS INITIALIZED TO ZEROES BEFORE BEING USED) MEANS THAT ONE OR MORE TESTS WERE SKIPPED FOR SOME REASON. IF ANY TESTS ARE FOUND "MISSED" THE PRINTOUT SHOWN BELOW IS DISPLAYED:

MISSED TEST
XXXXXX
YYYYYY

WHERE: XXXXXX AND YYYYYY ARE THE TEST NUMBERS MISSED.

B. ERROR HALTS

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1. BASIC INSTRUCTION TESTS (BIT)

ANY ERROR DETECTED IN THE BASIC TESTS CAUSES THE PROGRAM TO HALT WITH THE FOLLOWING INFORMATION DISPLAYED IN THE CONSOLE INDICATORS:

ADDRESS DISPLAY: ADDRESS + 2 OF THE LOCATION CONTAINING THE HALT. THIS IS USED TO LOCATE THE SPECIFIC ERROR CALL IN THE FAILING TEST

DATA DISPLAY: NUMBER OF THE FAILING TEST (IN OCTAL). USING THE SBTTL INDEX THIS MAY BE USED TO LOCATE THE FAILING TEST IN THE LISTING.

EXAMINING THE CONTENTS OF THE CPU'S GENERAL REGISTERS, THE PSW, AND THE STACK WILL PROVIDE ADDITIONAL FAULT IDENTIFICATION INFORMATION.

DEPRESSING "CONTINUE" AFTER THE HALT WILL CAUSE AN AUTOMATIC RETRY OF THE FAILING TEST. IF THE ERROR IS SOLID THE PROGRAM WILL LOCK ON THIS TEST, BUT IF IT IS INTERMITTENT THE PROGRAM WILL CONTINUE ON IN NORMAL SEQUENCE ONCE THE TEST IS SUCCESSFULLY EXECUTED.

TO ESTABLISH A TIGHT SCOPE LOOP ON THE FAILING TEST, REPLACE THE "HALT" WITH A 400(8). AND DEPRESS "CONTINUE" THE "400" IS A "BR .+2" WHICH FUNCTIONS AS A NOP. THIS IS NECESSARY TO PRESERVE THE INTEGRITY OF THE CONDITION CODE OPERATE INSTRUCTION THAT IS USED AS A SCOPE SYNC. THIS BUILT IN SYN URE IS DESCRIBED IN PARA. 6.0.

2. TRAPCATCHER HALTS

THE VECTOR AREA (LOC 000 - 776) IS PROGRAM LOADED WITH A STANDARD TRAPCATCHER AS SHOWN BELOW:

```
V   / V+2
V+2/ HALT
```

AFTER THE BASIC INSTRUCTION TESTS THE FOLLOWING VECTORS ARE SET UP TO POINT TO APPROPRIATE SERVICE ROUTINES:

4/6	BUS ERROR SERVICE
10/12	RSVD INSTRUCTION TRAP SERVICE
20/22	SCOPE LOOP SERVICE
24/26	POWER FAIL SERVICE
30/32	ERROR SERVICE
34/36	PRINT SERVICE

AT THE APPROPRIATE POINTS IN THE COMPREHENSIVE INSTRUCTION TESTS THE KW11-L VECTOR (100/102) AND THE DL11 VECTORS (60/62 - 64/66) ARE SET UP TO CHECK INTERRUPTS

FROM THESE DEVICES. ALL OTHER VECTORS REMAIN SET UP TO
"CATCH" UNEXPECTED TRAPS OR INTERRUPTS BY HALTING.

WHEN AN UNEXPECTED TRAP OR INTERRUPT NOT SUPPORTED BY
AN APPROPRIATE SERVICE ROUTINE OCCURS THE CPU HALTS.
WITH THE FOLLOWING INFORMATION DISPLAYED IN THE CONSOLE:

ADDRESS DISPLAY: V+4 OF THE VECTOR. THIS IS USED TO IDENTIFY THE CAUSE OF THE UNEXPECTED TRAP OR INTERRUPT.

DATA DISPLAY: TEST NO. OF THE LAST TEST BEING EXECUTED WHEN THE TRAP OR INTERR UPT OCCURRED.

THE LAST ENTRY PUSHED ON THE STACK CAN BE EXAMINED
TO DETERMINE WHERE THE PROGRAM WAS WHEN THE TRAP OR
INTERRUPT WAS SPRUNG. REMEMBER THAT THE "OLD PC" GETS
SAVED ON THE STACK WHEN A TRAP OR INTERRUPT OCCURS.

4. CATASTROPHIC ERROR HALTS

THERE ARE TWO HALTS, ONE IN THE BUS ERROR SERVICE ROU-
TINE AND THE OTHER IN THE RSVD INSTRUCTION TRAP SERVICE
ROUTINE THAT HALT THE PROGRAM IF ONE OF THESE ERRORS
OCCURS WHILE STILL SERVICING A PREVIOUS BUS ERROR
OR RSVD INSTRUCTION TRAP. AFTER THE HALT THE CONSOLE
DISPLAYS THE FOLLOWING INFORMATION:

ADDRESS DISPLAY: PC+2 OF THE ERROR HALT. THIS IS USED TO IDENTIFY WHICH OF THE TWO TYPES OF ERRORS - RSVD OR BUS ERROR.

DATA DISPLAY: LAST TEST NUMBER BEING EXECUTED WHEN THE TRAPS OCCURRED.

THERE IS A SOFTWARE FLAG TAGGED "CATERR" THAT MAY BE
EXAMINED TO OBTAIN THE FOLLOWING INFORMATION:

[CATERR] = 000002 TWO SUCCESSIVE BUS ERRORS
[CATERR] = 001000 TWO SUCCESSIVE RSVD INSTR. TRAPS
[CATERR] = 000401 A COMBINATION OF THE TWO. THE CONTENTS OF THE ADDRESS DISPLAY IDENTIFIES WHICH TYPE OCCURRED LAST.

THE STACK PROVIDES THE FOLLOWING ADDITIONAL INFORMATION:

[SP] / PC OF THE 2ND TRAP
[SP+2] / PSW OF THE 2ND TRAP
[SP+4] / PC OF THE 1ST TRAP
[SP+6] / PSW OF THE 1ST TRAP

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

THERE IS ONLY ONE PERFORMANCE REPORT SUPPLIED BY THE PROGRAM AND CONSISTS OF A SIMPLE END OF PASS MESSAGE OF THE FORMAT SHOWN BELOW:

PASCNT = XXXXXX ERRCNT = YYYYYY

WHERE: XXXXXX IS THE TOTAL NUMBER OF COMPLETE PASSES OF THE ENTIRE PROGRAM (OCTAL)

YYYYYY IS THE TOTAL ERROR COUNT IN OCTAL WHICH IS FROZEN WHEN IT REACHES 177777(8).

THIS PRINTOUT IS MODIFIED TO PRINT THE POWER FAIL COUNT AS DESCRIBED IN PARA. 3.1,AS ABOVE IF POWER FAILED DURING A PASS.

4.2 PROGRESS REPORTS

THERE ARE THREE PROGRESS REPORTS PRINTED THAT REPORT NORMAL ERROR FREE EXECUTION OF THE PROGRAM.

A. END OF PASS PRINTOUT AS DESCRIBED IN 4.1 ABOVE.

B. PROGRAM IDENTIFICATION MESSAGE AS DESCRIBED BELOW:

DBQEAB PDP11/40 CPU DIAGNOSTIC VERSION XXX

THIS MESSAGE GETS PRINTED THE FIRST TIME THE PROGRAM ENTERS THE COMPREHENSIVE INSTRUCTION TEST SECTION UNLESS INHIBITED BY SW12=1. AFTER THE FIRST PASS THIS PRINTOUT IS AUTOMATICALLY INHIBITED UNLESS THE PROGRAM IS RESTARTED AT 200(8).

C. PDP11/40 OPTIONS FOUND PRINTOUT

AFTER PRINTING THE PROGRAM I.D. MESSAGE, A SUBROUTINE IS CALLED TO "LOOK FOR" THE 11/40 INTERNAL OPTIONS (KT11-D, KW11-L,KE11-E,KE11-F,AND KJ11-A). IF ANY OF THESE OPTIONS ARE FOUND THE FOLLOWING PRINTOUT OCCURS:

PDP11/40 INTERNAL OPTIONS FOUND

XXXX-X

YYYY-Y

WHERE "X" AND "Y" ETC. ARE THE NAMES OF THE OPTIONS.

IF NO OPTIONS ARE FOUND THE FOLLOWING PRINTOUT OCCURS:

PDP11/40 INTERNAL OPTIONS FOUND

NONE FOUND

THE OPTIONS FOUND MESSAGE IS ONLY PRINTED ON THE FIRST PASS
THROUGH THE PROGRAM AND MAY ALSO BE INHIBITED BY SETTING SW12=1.

E. MAINTENANCE BREAKPOINT FEATURE

THERE IS A MANUAL PROGRESS REPORT FEATURE THAT ALLOWS THE USER
TO STEP THROUGH THE PROGRAM, HALTING AFTER EVERY N'TH TEST WITH
PROGRESS INFORMATION DISPLAYED IN THE CONSOLE ADDRESS AND DATA
DISPLAYS. TO ACTIVATE THIS FEATURE THE USER MUST SET THE DESIRED
"BREAKPOINT HALT" BITS IN THE MEMORY LOCATION TAGGED "BPTLOC".
THIS LOCATION PROVIDES SIXTEEN POSSIBLE HALTS DISPERSED EVENLY
THROUGHOUT THE PROGRAM (APPROX. EVERY 32 TESTS). AT EACH CHECK-
POINT THE PROGRAM EXAMINES A PARTICULAR BIT IN "BPTLOC" AND
HALTS IF THE BIT IS SET TO A "1" OTHERWISE IT CONTINUES IN
NORMAL SEQUENCE. AFTER THE HALT DEPRESSING "CONTINUE" WILL CAUSE
RESUMPTION OF NORMAL PROGRAM EXECUTION. SETTING LOCATION "BPTLOC"
TO ALL 1'S (177777) WILL RESULT IN THE FOLLOWING SIXTEEN HALTS
WITH THE INFORMATION SHOWN DISPLAYED IN THE CONSOLE:

[BPTLOC]	DATA DISPLAY TEST NO.	ADDRESS DISPLAY HALT PC+2
BIT00=1	000040	005076
BIT01=1	000077	007460
BIT02=1	000134	012574
BIT03=1	000174	014700
BIT04=1	000234	016434
BIT05=1	000274	021552
BIT06=1	000334	024532
BIT07=1	000374	027532
BIT08=1	000444	033506
BIT09=1	000504	037340
BIT10=1	000544	042222
BIT11=1	000604	045446
BIT12=1	000644	050226
BIT13=1	000704	054400
BIT14=1	000745	061222
BIT15=1	001005	063566

NOTE: IF THE USER DEPOSITED A 000400(8) IN LOCATION "BPTLOC"
ONLY ONE HALT WOULD OCCUR AND AT THAT TIME THE DATA
DISPLAY SHOULD CONTAIN 000444 AND THE ADDRESS DISPLAY
SHOULD CONTAIN 033506.

THIS FEATURE IS USEFUL FOR TRACKING DOWN THE TEST THAT CAUSES
A "RUNAWAY" OR "HUNG" PROGRAM.

LOCATION "BPTLOC" IS PROGRAM LOADED AS 000000 TO INHIBIT ANY HALTS.

5.0 DEVICE INFORMATION TABLES

5.1 KD11-A MICROPROGRAMMING INFORMATION

A. INTRODUCTION

THE KD11-A PROCESSOR EMPLOYS A MICROPROGRAMMED CONTROL SECTION THAT GENERATES THE PROPER SEQUENCES OF CONTROL SIGNALS REQUIRED TO EXECUTE THE PDP11 INSTRUCTION SET. THE HEART OF THE CONTROL IS A CONTROL STORE THAT CONSISTS OF 256 WORDS OF 56 BITS EACH, STORED IN A READ ONLY MEMORY (ROM). EACH 56 BIT WORD IS CALLED A MICROINSTRUCTION AND IS MICROPROGRAMMED TO PERFORM A UNIQUE ELEMENTARY OPERATION WITHIN THE PROCESSOR. EACH ONE OF THE 56 BITS IS ASSIGNED A PARTICULAR CONTROL FUNCTION THAT MAY BE TURNED "ON" OR "OFF" DEPENDENT UPON HOW EACH MICROWORD IS PROGRAMMED. TO ACTIVATE A SPECIFIC SET OF CONTROL SIGNALS SIMPLY MEANS READING OUT A SPECIFIC ROM ADDRESS. TO GENERATE A SPECIFIC SEQUENCE OF CONTROL SIGNAL SETS SIMPLY MEANS GENERATING A SPECIFIC ROM ADDRESS SEQUENCE. THE PURPOSE OF THIS SECTION IS TO DESCRIBE THE FUNCTION OF EACH BIT OR GROUP OF BITS (CALLED A FIELD) AND PROVIDE A LIST OF BACKPLANE TEST POINTS WHERE THE STATE OF ANY PARTICULAR BIT CAN BE OBSERVED.

B. MICROINSTRUCTION FORMAT

THIS SECTION LISTS THE FUNCTIONAL DESCRIPTION OF EACH BIT. FOR A MORE DETAILED DESCRIPTION OF THE SPECIFIC ENCODING REFER TO THE PDP11/40 SYSTEM ENGINEERING DRAWINGS, KD11A PROCESSOR (UWORD AND TABLES) SHEET.

BIT NO.	NAME	FUNCTIONAL DESCRIPTION
U<56:55>	CLKL<1:0>	THIS TWO BIT CONTROL FIELD IS USED TO SPECIFY THE CLOCK LENGTH FOR EACH MICROINSTRUCTION. THERE ARE THREE CLOCK LENGTHS POSSIBLE AS DESCRIBED BELOW: (PRT - PULSE REPETITION TIME) U<56:55>=00 OR 01 -CLOCK LENGTH 1 - GENERATES A "P1" PULSE WITH PRT=140NSEC U<56:55>=10 -CLOCK LENGTH 2 - GENERATES A "P2" PULSE WITH PRT=200NS U<56:55>=11 -CLOCK LENGTH 3 - GENERATES A "P2" PULSE

```
                                                                FOLLOWED 100 NSEC LATER
                                                                BY A "P3" PULSE. TOTAL
                                                                PRT=300 NSEC.

                        U<54>           CLKOFF          THIS BIT ALLOWS TURNING OFF THE PRO-
                                                        CESSOR CLOCK TO STALL PROCESSOR OPERA-
                                                        TIONS WHILE WAITING FOR SOME INTERNAL
                                                        OR EXTERNAL RESPONSE.

                        U<53>           CLKIR           THIS BIT ENABLES CLOCKING NEW DATA
                                                        INTO THE INSTRUCTION REGISTER.  IT IS
                                                        ONLY ACTIVE WHEN THE PROCESSOR IS
                                                        FETCHING A NEW INSTRUCTION.

                        U<52:51>        WRH,WRL         THESE TWO BITS CONTROL THE WRITING
                                                        INTO THE PROCESSOR'S GENERAL REGIS-
                                                        TERS.  THEY PROVIDE THE MECHANISM FOR
                                                        CONTROLLING WHETHER WE READ, WRITE A
                                                        16 BIT WORD, OR WRITE AN 8 BIT BYTE AS
                                                        DESCRIBED BELOW:

                                                        U<52:51>=00   READ ONLY - INHIBIT
                                                                      WRITING

                                                        U<52:51>=01   WRITE ONLY THE LOW
                                                                      BYTE BITS <7:0>

                                                        U<52:51>=11   WRITE A FULL 16 BIT
                                                                      WORD BITS <15:00>

                        U<50>           CLKB            THIS BIT ALLOWS CLOCKING NEW DATA
                                                        INTO THE "B" REGISTER

                                                        U<50>=0   HOLD B REGISTER

                                                        U<50>=1   LOAD B REGISTER

                        U<49>           CLKD            THIS BIT ALLOWS CLOCKING THE OUTPUT
                                                        OF THE "ALU" INTO THE "D" REGISTER.

                                                        U<49>=0   HOLD D REGISTER

                                                        U<49>=1   LOAD "D" REGISTER

                        U<48>           CLKBA           THIS BIT ALLOWS CLOCKING THE BUS
                                                        ADDRESS REGISTER "BA"

                                                        U<48>=0   HOLD BA REGISTER

                                                        U<48>=1   LOAD BA REGISTER

                        U<47:46>        C1BUS,COBUS     THIS TWO BIT FIELD SPECIFIES THE
                                                        TYPE OF DATA TRANSFER BUS CYCLE WHEN
                                                        U<45> BGBUS IS ACTIVE

                                                        U<46:47>=00   DATI
```

```
                                                                U<46:47>=01   DATIP
                                                                U<46:47>=10   DATO
                                                                U<46:47>=11   DATOB

                                                                WHEN U<45> IS INACTIVE U<47:46> ARE
                                                                USED TO CONTROL INTERNAL PROCESSOR
                                                                LOGIC RELATED TO PRIORITY TRANSFER
                                                                OF UNIBUS CONTROL

                                        U<45>           BGBUS   THIS BIT IS USED TO TRIGGER INITIATION
                                                                OF A UNIBUS DATA TRANSFER BUS CYCLE
                                                                WHICH RESULTS IN ACTIVATING BUS MSYN:

                                        U<44:41>        DAD<3:0>THIS FOUR BIT FIELD (DISCRETE ALTER-
                                                                ATION OF DATA) PROVIDES THE MECHANISM
                                                                FOR ALTERING THE OPERATION OF THE
                                                                BASIC CONTROL FUNCTIONS BASED ON
                                                                CONDITIONS EXISTING WITHIN THE PRO-
                                                                CESSOR.  IE:  CHECK FOR STACK OVFLW
                                                                IF PUSHING ON STACK, ALLOW ODD ADDRESS
                                                                IF BYTE INSTRUCTION, MODIFY ALU OPER-
                                                                ATION AS A FUNCTION OF THE IR DECODE
                                                                ETC.

                                        U<40:38>        SPS<2:0>THIS THREE BIT FIELD CONTROLS LOADING,
                                                                CLOCKING, AND GATING OF THE PROCESSOR
                                                                STATUS WORD.

                                        U<37:33>        ALUM,S<3:0>THESE FIVE BITS CONTROL WHAT OPERATION
                                                                IS TO BE PERFORMED BY THE PROCESSOR'S
                                                                ALU.  THE FINAL ALU CONTROL IS SUBJECT
                                                                TO MODIFICATION BY THE "DAD" CODE AS
                                                                DESCRIBED ABOVE.

                                        U<32:29>        SBC<3:0>THIS FOUR BIT FIELD IS ENCODED TO
                                                                SELECT SPECIFIC CONSTANTS THAT MAY
                                                                BE FED INTO THE ALU'S "B" INPUT VIA
                                                                THE B MUX.  IE: SWR ADDRESS=177570

                                        U<28:27>        SBMH<1:0>THIS TWO BIT FIELD IS USED TO CONTROL
                                                                THE HIGH SECTION OF THE B MUX, BITS
                                                                <15:08> AND DETERMINES WHAT APPEARS
                                                                AT THE B INPUT TO THE ALU, BIN<15:08>

                                                                U<28:27>=00  BIN<15:08>=BREG<15:08>
                                                                U<28:27>=01  BIN<15:08>=BREG07(SEX)
                                                                U<28:27>=10  BIN<15:08>=BREG<07:00>(BYTE)
                                                                U<28:27>=11  BIN<15:08>=BCON<15:08>(CONSTANT)

                                        U<26:25>        SBML<1:0>THIS TWO BIT FIELD IS USED TO CONTROL
                                                                THE LOW SECTION OF THE B MUX, BITS
                                                                <07:00>.  AND DETERMINES WHAT APPEARS
                                                                AT THE B INPUT TO THE ALU.  BIN<07:00>

                                                                U<26:25>=00  BIN<07:00>=BREG<07:00>
                                                                U<26:25>=01  BIN<07:00>=BREG<07:00>
```

```
1021                                                    U<26:25>=10  BIN<07:00=BREG<15:08>(BYTE)
1022                                                    U<26:25>=11  BIN<07:00>=BCON<07:00>(CONSTANT)
1023
1024                                    U<24:23>        SDM<1:0>    THIS TWO BIT FIELD IS USED TO SELECT
1025                                                                ONE OF FOUR INPUTS THAT APPEAR AT THE
1026                                                                INPUT TO THE "D" MUX.
1027
1028                                                                U<24:23>=00  DMUX<15:00>=BUS RD<15:00>(REG)
1029                                                                U<24:23>=01  DMUX<15:00>=BUS D<15-00>(UNIBUS)
1030                                                                U<24:23>=10  DMUX<15:00>=D<15:00>
1031                                                                U<24:23>=11  DMUX<15:00>=D<C>,D<15:01>(SHF RIGHT
1032
1033                                    U<22>           SBAM        THIS BIT IS USED TO SELECT THE DATA
1034                                                                LOADED INTO THE BA REGISTER
1035
1036                                                                U<22>=1  BA<15:00=BUS RD<15:00>(REG)
1037                                                                U<22>=0  BA<15:00>=ALU<15:00>
1038
1039                                                                BIT 48 (CLKBA) MUST BE ACTIVE TO
1040                                                                ALLOW CLOCKING INTO THE BA REGISTER.
1041
1042                                    U<21:17>        UBF<4:0>    THIS FOUR BIT FIELD (BUT BITS) IS USED
1043                                                                TO SPECIFY ONE OF 16 POSSIBLE MICRO-
1044                                                                BRANCH TESTS WHICH PROVIDES THE MECHANISM
1045                                                                FOR MODIFYING THE ROM ADDRESS SEQUENCE
1046                                                                GENERATED BASED ON THE PRESENCE OR
1047                                                                ABSENCE OF SPECIFIC CONDITIONS.
1048
1049                                    U<16:13>        SR<S,D,BA,I>THESE FOUR BITS ARE USED TO SELECT
1050                                                                THE SPECIFIC BITS USED TO ADDRESS A
1051                                                                GENERAL REGISTER.
1052
1053                                                                SRS =1 USE IR<8:6> SOURCE REG BITS
1054                                                                SRD =1 USE IR<2:0> DEST REG BITS
1055                                                                SRBA=1 USE BA<3:0> CONSOLE (EXAM + DEP)
1056                                                                SRI =1 USE U<12:9> MICROWORD
1057
1058                                    U<12:09>        RIF<3:0>    THESE FOUR BITS SPECIFY WHICH GENERAL
1059                                                                REGISTER TO ACCESS IF "SRI" (U<13>)
1060                                                                IS ACTIVE
1061
1062                                                                U<12:09>=0000  R0
1063                                                                U<12:09>=0001  R1
1064                                                                U<12:09>=0001
1065                                                                U<12:09>=0001
1066                                                                U<12:09>=1111  R17
1067
1068                                    U<08>           UPF8        THIS BIT IS NOT STORED IN THE ROM BUT
1069                                                                IS A SEPARATE CONTROL SIGNAL THAT
1070                                                                PROVIDES THE MECHANISM FOR IMPLEMENTING
1071                                                                AN EXPANSION ROM WHEN THE EIS/FIS
1072                                                                OPTIONS ARE INSTALLED - NOT IN THE
1073                                                                BASIC MACHINE.
1074
1075                                    U<07:00>        UPF<7:0>    THIS EIGHT BUT FIELD (NEXT FIELD) PRO-
1076                                                                VIDES A MEANS OF EACH MICROINSTRUCTION
```

```
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
```

TO SPECIFY THE ADDRESS OF THE NEXT
MICROWORD TO BE ACCESSED. THE CONTENTS
OF THIS FIELD MAY BE MODIFIED AS A
RESULT OF A MICROBRANCH TEST BEFORE
BEING LOADED INTO THE ROM ADDRESS
REGISTER. (UPP<7:0>.

IT IS THE COMBINATION OF THIS FIELD
AND THE BUT BITS U<21:17> THAT MAKE
IT POSSIBLE TO GENERATE VARIABLE ROM
ADDRESS SEQUENCES.

THESE 8 BITS ARE UNIQUE IN THAT THEY
ARE ACTIVE (1) WHEN "LOW" IN CONTRAST
TO ALL OTHER BITS THAT ARE ACTIVE (1)
WHEN HIGH.

   IE: UPF<7:0>=01010010 = ADDRESS 255

5.2 MICROWORD CONTROL SIGNAL TEST POINTS

KD11-A MICROWORD CONTROL SIGNALS (SH1 OF 2)

U(N)	PRINT	SIGNAL NAME		ROM	UREG
56	K2-8	CLKL1(1)	H	E38-09	D03N2
56	"	CLKL1(0)	H	"	D03M2
55	"	CLKLO(1)	H	E38-10	D03L2
55	"	CLKLO(1)	H	"	D03R1
54	"	CLKOFF(1)	H	E38-11	D03U2
53	"	CLKIR(1)	H	E38-12	D03T2
52	K2-7	WRH(1)	H	E34-09	D03J2
51	"	WRL(1)	H	E34-10	D03H2
50	"	CLKB(1)	H	E34-11	D03J1
49	"	CLKD(1)	H	E34-12	D03K2
48	"	CLKBA(1)	H	E35-09	D03L1
47	"	C1BUS(1)	H	E35-10	D03K1
46	"	C0BUS(1)	H	E35-11	D03F2
45	"	3GBUS(1)	H	E35-12	D03E2
44	"	DAD3(1)	H	E37-09	D03M1
43	"	DAD2(1)	H	E37-10	D03N1
42	"	DAD1(1)	H	E37-11	D03P1
41	"	DAD0(1)	H	E37-12	D03D2
40	K2-6	SPS2(1)	H	E31-09	C03M2
39	"	SPS1(1)	H	E31-10	D03H1
38	"	SPS0(1)	H	E31-11	D03F1
37	"	SALUM(1)	H	E31-12	D03E1
36	"	SALU3(1)	H	E30-09	C03N2
35	"	SALU2(1)	H	E30-10	C03P2
34	"	SALU1(1)	H	E30-11	C03T2
33	"	SALU0(1)	H	E30-12	C03U2
32	"	SBC3(1)	H	E27-09	C03S2
31	"	SBC2(1)	H	E27-10	C03U2
30	"	SBC1(1)	H	E27-11	C03R2
29	"	SBC0(1)	H	E27-12	D03D1

KD11-A MICROWORD CONTROL SIGNALS (SH2 OF 2)

U<N>	PRINT	SIGNAL NAME		ROM	UREG
28	K2-5	SBMH1(1)	H	E22-09	C03N1
27	"	SBMH0(1)	H	E22-10	C03M1
26	"	SBML1(1)	H	E22-11	C03L1
25	"	SBML0(1)	H	E22-12	C03J1
24	"	SDM1(1)	H	E23-09	C03L2
23	"	SDM0(1)	H	E23-10	C03K2
22	"	SBAM(1)	H	E23-11	C03J2
21	"	UBF4(1)	H	E23-12	C03H2
20	"	UBF3(1)	H	E26-09	C03S1
19	"	UBF2(1)	H	E26-10	C03R1
18	"	UBF1(1)	H	E26-11	C03P1
17	"	UBF0(1)	H	E26-12	C03F2
16	K2-4	SRS(1)	H	E21-09	C03E1
15	"	SRD(1)	H	E21-10	C03D2
14	"	SRBA(1)	H	E21-11	C03E2
13	"	SRI(1)	H	E21-12	C03B1
12	"	RIF3(1)	H	E20-09	B03S1
11	"	RIF2(1)	H	E20-10	B03U1
10	"	RIF1(1)	H	E20-11	B03U2
09	"	RIF0(1)	H	E20-12	B03T2
08	K2-3	BUPP8(1)	H	N/A	B03E2
07	"	BUPP7(1)	H	E14-09	B03J2
06	"	BUPP6(1)	H	E14-10	B03M2
05	"	BUPP5(1)	H	E14-11	B03P2
04	"	BUPP4(1)	H	E14-12	B03R2
03	K2-2	BUPP3(1)	H	E15-09	A03L2
02	"	BUPP2(1)	H	E15-10	A03P2
01	"	BUPP1(1)	H	E15-11	A03S2
00	"	BUPP0(1)	H	E15-12	A03U2

NOTES:

1. THE ROM TEST POINTS CORRESPOND TO THE WORD BEING READ OUT AS DEFINED BY THE CONTENTS OF THE "UPP"
2. THE UREG TEST POINTS CORRESPOND TO THE WORD BEING EXECUTED AS DEFINED BY THE CONTENTS OF THE "PUPP"
3. AN "H" (HIGH LEVEL) IS OBSERVED IF THE BIT IS PROGRAMMED AS A "1" AND A "L" (LOW LEVEL) IS OBSERVED IF THE BIT IS PROGRAMMED AS A "0" WITH EXCEPTION OF THE "UPF" FIELD BITS <7:0> WHEN OBSERVED AT THE OUTPUT OF THE ROM DIRECTLY. IN THIS CASE THE BITS ARE STORED IN 1'S COMPLEMENT FORM.

5.3 KD11-A LOGIC PRINT SUMMARY

THE LOGIC CIRCUIT DESIGN USED TO IMPLEMENT THE KD11-A CPU IS WELL ORGANIZED AND LOGICALLY PARTITIONED INTO FUNCTIONAL AREAS ON THE FIVE MODULES(4 HEX AND 1 QUAD). EACH MODULE IS IDENTIFIED FOR DOCUMENTATION PURPOSES BY A "KN" NUMBER AS LISTED BELOW AND EACH PRINT APPROPRIATELY ITENTIFIED WITHIN THE PRINT SET:

M7231	DATA PATHS	PRINTS K1-1 THRU K1-9
M7232	UWORD (ROM)	PRINTS K2-1 THRU K2-8
M7233	IR DECODE	PRINTS K3-1 THRU K3-9
M7234	TIMING	PRINTS K4-1 THRU K4-6
M7235	STATUS	PRINTS K5-1 THRU K5-8

THE FIRST PRINT IN EACH SET (KN-1) SHOWS THE PHYSICAL LAYOUT OF THE MODULE AND INCLUDES A COMPONENT PARTS LIST. THE LOGIC PARTITIONING INTO FUNCTIONAL AREAS IS SUMMARIZED IN THE TABLE BELOW:

```
1199                                    ****** M7231 ******
1200
1201                            K1-2    DESCRIBES THE LOGIC AREAS THAT SUPPORT THE PRIMARY
1202                                    DATA PATH FACILITIES FOR BITS<03:00> THAT INCLUDES:
1203
1204                                            1. UNIBUS DATA RECEIVERS AND DRIVERS
1205                                            2. REGISTER DATA BUS RECEIVERS
1206                                            3. "D" MULTIPLEXOR
1207                                            4. "B" MULTIPLEXOR
1208                                            5. "D" REGISTER
1209                                            6. "B" REGISTER
1210                                            7. ARITHMETIC LOGIC UNIT
1211                                            8. "BA" MULTIPLEXOR
1212
1213                            K1-3    SAME AS THE K1-2 EXCEPT IT SUPPORTS BITS<07:04>
1214
1215                            K1-4    SAME AS THE K1-2 EXCEP IT SUPPORTS BITS<11:08>
1216
1217                            K1-5    SAME AS THE K1-2 EXCEPT IT SUPPORTS BITS<15:12>
1218                                    AND ALSO INCLUDES*
1219
1220                                            1. "COUT" MULTIPLEXOR
1221                                            2. "D<C>" CONTROL FLOP
1222
1223                            K1-6    DESCRIBES THE LOGIC THAT SUPPORTS:
1224
1225                                            1. BUS ADDRESS REGISTER (BA)
1226                                            2. UNIBUS ADDRESS LINE DRIVERS
1227
1228                            K1-7    DESCRIBES THE IMPLEMENTATION OF:
1229
1230                                            1. INTERNAL ADDRESS DECODERS
1231                                            2. "D" REGISTER DECODER
1232
1233                            K1-8    DESCRIBES THE:
1234
1235                                            1. GENERAL REGESTERS (R00 THRU R17)
1236                                            2. GENERAL REGISTER ADDRESS SELECTION SWITCHES
1237
1238                            K1-9    DESCRIBES THE:
1239
1240                                            1. KY11-D DATA DISPLAY AND SWITCH REGISTER
1241                                               INTERFACES
1242                                            2. CABLE CONNECTOR
1243
1244
```

```
1245                                    ****** M7232 ******
1246
1247                            K2-2    DESCRIBES THE:
1248
1249                                            1. UPP REGISTER BITS<03:00>
1250                                            2. PUPP REGISTER BITS<03:00>
1251                                            3. MICROBRANCH CONTROL "OR" GATES BITS<03:00>
1252
1253                            K2-3    DESCRIBES THE:
1254
1255                                            1. UPP REGISTER BITS<08:04>
1256                                            2. PUPP REGISTER BITS<08:04>
1257                                            3. MICROBRANCH CONTROL "OR" GATES BITS<07:04>
1258
1259                            K2-4    DESCRIBES THE:
1260
1261                                            1. ROM U<16:09>
1262                                            2. UREG <16:09>
1263
1264                            K2-5    DESCRIBES THE:
1265
1266                                            1. ROM U <28:17>
1267                                            2. UREG <28:17>
1268
1269                            K2-6    DESCRIBES THE:
1270
1271                                            1. ROM U <40:29>
1272                                            2. UREG <40:29>
1273
1274                            K2-7    DESCRIBES THE:
1275
1276                                            1. ROM U <52:41>
1277                                            2. UREG <52:41>
1278
1279                            K2-8    DESCRIBES THE:
1280
1281                                            1. ROM U <56:53>
1282                                            2. UREG <56:53>
1283                                            3. EXPANSION ROM CONNECTORS
1284
1285
```

```
1286                                    ****** M7233 ******
1287
1288                            K3-2    DESCRIBES THE:
1289
1290                                            1. BUT MULTIPLEXOR
1291
1292                            K3-3    DESCRIBES THE:
1293
1294                                            1. INSTRUCTION REGISTER
1295                                            2. IR DECODERS
1296
1297                            K3-4    DESCRIBES THE:
1298
1299                                            1. IR DECODERS
1300                                            2. "OVLAP" DECODER
1301
1302                            K3-5    DESCRIBES THE:
1303
1304                                            1. MICRO BRANCH CONTROL LOGIC
1305
1306                            K3-6    DESCRIBES THE*
1307
1308                                            1. IR DECODERS (DISCRETE)
1309
1310                            K3-7    DESCRIBES THE:
1311
1312                                            1. MICROBRANCH CONTROL LOGIC
1313
1314                            K3-8    DESCRIBES THE:
1315
1316                                            1. "COUT" MUX CONTROL LOGIC
1317                                            2. AUX ALU CONTROL MULTIPLEXORS
1318                                            3. "CIN" GENERATION LOGIC
1319
1320                            K3-9    DESCRIBES THE:
1321
1322                                            1. "C" AND "V" BIT CONTROL LOGIC
1323
1324
```

```
1325                                        ****** M7234 ******
1326
1327                                K4-2    DESCRIBES THE:
1328
1329                                                1. CPU CLOCK WITH ASYNCHRONOUS CONTROL LOGIC
1330                                                2. PRIMARY REGISTER TIMING LOGIC FOR:
1331
1332                                                        A. UPP AND PUPP REGISTERS
1333                                                        B. U REGISTER
1334                                                        C. INSTRUCTION REGISTER
1335                                                        D. B, D, AND BA REGISTERS
1336                                                        E. GENERAL REGISTERS - WRITE TIMING
1337
1338                                K4-3    DESCRIBES THE:
1339
1340                                                1. JAMUPP CONTROL LOGIC AND TIMING
1341
1342                                K4-4    DESCRIBES THE:
1343
1344                                                1. UNIBUS DATA TRANSFER CONTROL LOGIC
1345
1346                                K4-5    DESCRIBES THE:
1347
1348                                                1. BUS PRIORITY TRANSFER CONTROL LOGIC
1349
1350                                K4-6    DESCRIBES THE:
1351
1352                                                1. PRIORITY ARBITRATION LOGIC FOR "BR'S"
1353                                                2. BUS TIMEOUT AND NO SACK TIMEOUT CONTROL
1354
1355
```

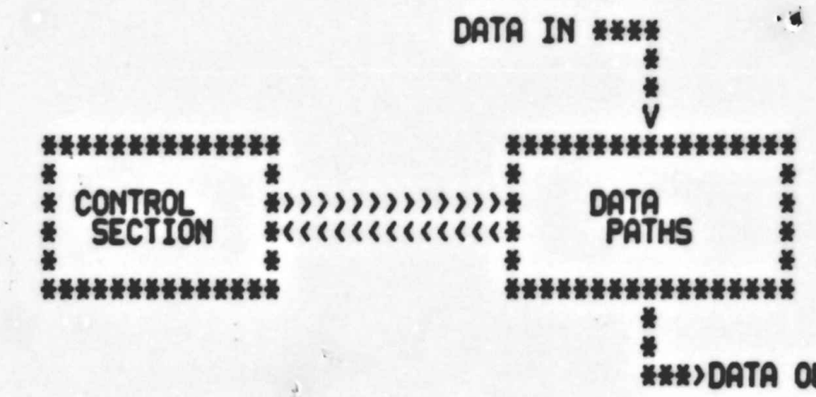
```
1356                                        ****** M7235 ******
1357
1358                                K5-2    DESCRIBES THE:
1359
1360                                                1. PROCESSOR STATUS REGISTER
1361                                                2. PSW CONTROL
1362                                                3. PSW BUS DRIVERS (UNIBUS AND RD BUS)
1363
1364                                K5-3    DESCRIBES THE:
1365
1366                                                1. BRANCH INSTRUCTION DECODERS
1367                                                2. "BUT" DECODER (WORKING BUTS)
1368
1369                                K5-4    DESCRIBES THE:
1370
1371                                                1. MISCELLANEOUS HISTORY AND CONTROL FLOPS
1372
1373                                K5-5    DESCRIBES THE:
1374
1375                                                1. "B" CONSTANTS GENERACTOR
1376                                                2. TRAP VECTOR ADDRESS GENERATOR
1377
1378                                K5-6    DESCRIBES THE:
1379
1380                                                1. CONSOLE CONTROL SWITCH INTERFACE
1381
1382                                K5-7    DESCRIBES THE:
1383
1384                                                1. CONSOLE INTERFACE CABLE CONNECTIONS
1385
1386                                K5-8    DESCRIBES THE:
1387
1388                                                1. POWER FAIL/AUTO RESTART CONTROL LOGIC
1389
1390
1391
```

6.0 MAINTENANCE PROCEDURES

6.1 INTRODUCTION

THE PROCEDURES OUTLINED IN THIS SECTION ASSUME THAT "DBQEAA" CAN BE LOADED INTO CORE AND STARTED. IF THE FAILURE MODE PREVENTS PROGRAM LOADING OR AFFECTS NORMAL POWER UP AND CONSOLE OPERATIONS, THE TECHNICIAN MUST REVERT TO THE MANUAL DEBUG AND CHECKOUT PROCEDURES CONTAINED IN THE "BCPT" DOCUMENT.

THE FIVE MODULES THAT COMPRISE THE KD11-A CENTRAL PROCESSING UNIT OF AN 11/40 SYSTEM CAN BE VIEWED AS CONSISTING OF TWO MAJOR INTERRACTING AND INTERDEPENDENT LOGIC AREAS AS DEPICT-BELOW:



THE DATA PATHS CONSIST OF A LOGICALLY INTERCONNECTED GROUP OF STATIC DATA FACILITIES (REGISTERS, MULTIPLEXORS, ALU'S ETC.) REQUIRED TO TEMPORARILY STORE, MODIFY, AND TRANSFER DATA ITEMS (16 BIT WORDS OR 8 BIT BYTES) ACCORDING TO THE DESIGN SPECIFICATIONS FOR THE PDP11.

THE CONTROL SECTION SUPPLIES PREDEFINED SEQUENCES OF CONTROL SIGNAL SETS TO ACTIVATE THE REQUIRED DATA FACILITIES WITHIN THE DATA PATHS. IN THE KD11-A THESE CONTROL SIGNAL SETS ARE STORED IN A READ ONLY MEMORY (ROM) AND GENERATED BY READING OUT A UNIQUE SEQUENCE OF ROM WORDS FOR EACH OPERATION TO BE PERFORMED.

THE SEQUENCE GENERATED BY THE CONTROL SECTION IS VARIABLE AND DEPENDENT UPON THE INSTRUCTION OR LOGIC OPERATION BEING EXECUTED. THERE ARE HUNDREDS OF THESE SEQUENCES POSS-IBLE DEPENDENT UPON OF THE PROGRAM CODING.

"DBQEAA" IS DESIGNED TO GENERATE ALL POSSIBLE MICROINSTRUCTION SEQUENCES AND COMBINATIONS OF DATA AND CONTROL SIGNALS. THE INDIVIDUAL TESTS ARE LOGICALLY SEQUENCED AND STRUCTURED TO DETECT AND ISOLATE PARTICULAR MICROPROGRAM SEQUENCES THAT ARE FAULTY.

6.2 MICROPROGRAMMING / LOGIC INFORMATION

ALL OF THE TESTS DESIGNED TO TEST AND VERIFY A SPECIFIC INST-
RUCTION OR LOGIC OPERATION CONTAIN A MAINTENANCE HEADER IN THE
LISTING AT THE BEGINNING OF THE TEST. THIS HEADER PROVIDES THE
TECHNICIAN WITH DETAILED MICROPROGRAMMING AND LOGIC INFORMATION
RELATIVE TO THE INSTRUCTION OR LOGIC OPERATION BEING TESTED.
THIS SECTION OF THE DOCUMENT DESCRIBES THE FORMAT AND CONTENT
OF THIS INFORMATION AND SUGGESTS WAYS THAT THE TECHNICIAN
MAY USE IT TO ISOLATE FAULTS TO THE FAILING MODULE OR IC.

INFORMATION FORMAT:

THE MAINTENANCE HEADER SHOWN BELOW IS FOR THE TEST THAT
VERIFIES THE OPERATION OF THE INSTRUCTION:

"DECB 1(SP)"

WHERE: 1)THE INITIAL CONTENTS OF THE STACK WORD IS 000000
2)THE DEC (DECREMENT) MODIFIES THIS TO 177400 (DEC ODD BYTE)

HEADER:

```
;MICROPROGRAMMING / LOGIC INFORMATION

;ROM SEQ:        [166,261,262,267,237,270,222,253,075,374,375,
                 016] FC 1,3,9,8

;ACT BUTS:       37[004]100,166 / 17[166]262,262 / 33[266]220,237
                 34[237]220,222 / 16[374]016,016

;EXEC:           [222]ALUC=LHHHH :[375] D=177400

;CODES:          [253]SPS=1, [275]SPS=3 / N:C = 1000

;SYNC:           B05J2  (-)  T = 4.0 USEC

;KEY SIG:        K3-3 DM=6 L / K3-4 DEC L / K3-6 BYTE INSTR H
                 K3-7 ODD BYTE L
```

1) ROM SEQ ENTRIES:

THIS LISTS THE ROM ADDRESS SEQUENCE THAT MUST BE GENERAT
ED TO PROPERLY EXECUTE THE INSTRUCTION. IT BEGINS WITH
THE FIRST ROM WORD AFTER FETCH AND INCLUDES ALL MICRO-
WORDS UP TO THE BEGINNING OF THE NEXT FETCH. THIS IS
THE SEQUENCE THE TECHNICIAN SHOULD OBSERVE WHEN CLOCK-
ING THE ROM USING THE KM-11 MAINTENANCE MODULE. IT ALSO
INCLUDES A LIST OF THE FLOW CHART NUMBERS TO REFER TO
TO OBTAIN THE DETAILS OF EACH MICROWORD.

2) ACT BUTS (ACTIVE MICROBRANCH TESTS) ENTRIES:

THIS IS A LIST OF ONE OR MORE ENTRIES THAT INDICATE
ALL THE MICROBRANCHES THAT OCCUR DURING THE SEQUENCE.
EACH ENTRY CONSISTS OF FOUR OCTAL NUMBERS AND EACH
SEPARATE ENTRY IS DELIMITED BY A "/". THE NO.S ARE
INTERPRETED AS FOLLOWS:

A) THE FIRST NO. IS THE OCTAL CODE OF THE
BUT (UBF <4:0> FIELD)
B) THE SECOND NO. (IN BRACKETS) INDICATES
THE ADDRESS OF THE WORD CONTAINING THE BUT
C) THE THIRD NO. INDICATES THE ENCODING OF THE
NEXT FIELD (UPF <7:0>). THIS IS THE BASE
ADDRESS THAT MAY OR MAY NOT BE MODIFIED BY
THE MICROBRANCH TEST.
D) THE FOURTH NO. INDICATES THE RESULT OF THE
MICROBRANCH MODIFICATION. BY COMPARING THIS
NO. WITH THE NEXT FIELD IT IS POSSIBLE TO
DETERMINE WHICH MICROBRANCH CONTROL SIGNALS
MUST BE ASSERTED TO OBTAIN THE PROPER ROM
SEQUENCE.

THE KEY TO GENERATING THE PROPER MICROINSTRUCTION
SEQUENCE IS WHAT THE "BUT" DOES TO GENERATE THE
MICROBRANCH CONTROL SIGNALS (K3-2 BUBC<5:0>).
FROM THE "ACT BUTS" INFORMATION THE TECHNICIAN CAN
QUICKLY DETERMINE WHICH OF THESE SIGNALS MUST BE
ACTIVE TO GENERATE THE PROPER ROM SEQUENCE.

FOR EXAMPLE THE ENTRY: 37[004]100,166

INDICATES THAT THE BUT37 IN LOC 004 MUST MODIFY THE
ROM ADDRESS IN SUCH A WAY THAT THE 100 (NEXT FIELD)
GETS CHANGED TO A 166. THIS MEANS THAT WE MUST SOME-
HOW "OR" IN A 066 WITH THE BASE ADDRESS OF 100. THIS
IS DONE BY GENERATING THE FOLLOWING CONTROL SIGNALS:

K3-2 BUBC5, BUBC4, BUBC2, AND BUBC1

ALL OF THESE SIGNALS CAN BE OBSERVED AT THE OUTPUT
OF THE "BUT MUX" ON THE K3-2 PRINT. IT IS IMPORTANT
THAT THEY BE OBSERVED WHEN THE PUPP=004 WHIC IS
THE WORD CONTAINING THE BUT37.

SINCE OVER 50% OF THE LOGIC FAULTS THAT CAN OCCUR
IN THE KD11-A WILL MANIFEST THEMSELVES BY CAUSING
AN INCORRECT ROM SEQUENCE TO BE GENERATED, THIS
INFORMATION PROVIDES THE TECHNICIAN WITH A CONVENIENT
STARTING POINT TO PROCEED TO ISOLATE THE FAULTY COMP-
ONENT.

3) EXEC ENTRIES:

THESE ENTRIES DESCRIBE TWO IMPORTANT MICROWORDS.

A) THE WORD THAT EXECUTES THE INSTRUCTION
B) THE WORD WHERE THE RESULT MAY BE OBSERVED

IN THE DATA DISPLAY ON THE CONSOLE

THE FIRST ENTRY INCLUDES A ROM ADDRESS THAT CONTAINS THE MICROINSTRUCTION THAT EXECUTES THE INSTRUCTION AND INCLUDES THE REQUIRED STATE OF THE ALU CONTROL SIGNALS TO PERFORM THE CORRECT OPERATION ON THE DATA AS DESCRIBED BELOW:

ALUC = ALU M,S<3:0> = LHHHH

WHICH MEANS THE LOGIC LEVELS SHOWN BELOW MUST EXIST:

K3-8 ALUM L
K3-8 ALUS3 H
K3-8 ALUS2 H
K3-8 ALUS1 H
K3-8 ALUS0 H

THE SECOND ENTRY SPECIFIES THE ROM ADDRESS WHERE THE RESULT IS DISPLAYED IN THE CONSOLE DATA DISPLAY. IN THE EXAMPLE SHOWN WITH THE ROM AT PUPP=375 THE DATA DISPLAY ON THE CONSOLE SHOULD CONTAIN A 177400.

4) CODES ENTRIES:

THIS ENTRY SPECIFIES THE SPS CODES USED TO ALTER THE FLAGS AND THE ROM WORDS THAT CONTAIN THESE CODES. WHERE APPLICABLE IT ALSO SPECIFIES HOW THE CODES SHOULD APPEAR AFTER THE INSTRUCTION. IN THE EXAMPLE:

N:C = 1000 MEANS THE THE "N" BIT IS SET AND THE "Z","V", AND "C" BITS ARE CLEAR.

5) SYNC ENTRIES:

THIS INFORMATION CONTAINS A BACKBOARD PIN NO. THAT MAY BE USED TO SYNC DURING A SCOPE LOOP, THE SCOPE TRIGGER SLOPE (-) TRAILING EDGE TO USE, AND THE APPROXIMATE SETTING OF THE HORIZONTAL SWEEP LENGTH. THIS INSURES THAT WHEN LOOPING ON A TEST, ONLY THE AREA OF INTEREST (THE TEST INSTRUCTION) IS DISPLAYED. THIS MINIMIZES THE POSSIBILITY OF LOOKING AT SIGNALS AT THE "WRONG TIME".

6) KEY SIGNALS:

THIS ENTRY CONTAINS A LIST OF UNIQUE SIGNALS THAT MUST BE ACTIVATED TO PROPERLY EXECUTE THE OPERATION UNDER TEST. THIS ALSO HELPS TO POINT THE TECHNICIAN TO THE KEY FUNCTIONAL AREAS OF LOGIC IN THE PRINT SETS.

6.3 KM11 MAINTENANCE MODULE

A. PURPOSE

THE KM11 MAINTENANCE MODULE OPTION PROVIDES THE TECHNICIAN WITH A MECHANISM FOR SINGLE CLOCKING THE KD11-A MICROPROGRAM. IT ALLOWS HIM TO VERIFY THAT THE PROPER ROM SEQUENCES ARE BEING GENERATED AND ALSO TO "FREEZE" THE ROM AT ANY ADDRESS AND CHECK THE CONTROL AND DATA PATH SIGNALS THAT SHOULD BE ACTIVE FOR THE PARTICULAR MICROWORD BEING INVESTIGATED.

B. BASIC COMPONENTS

1. W130 — SINGLE HEIGHT MODULE THAT CONTAINS THE INDICATOR DRIVERS FO THE W131 AND ALSO DOUBLES AS A MODULE EXTENDER FOR THE W131. WHEN INSTALLED IT PLUGS INTO SLOT "F1" IN THE KD11-A BACKPLANE WHICH IS PREWIRED TO ACCEPT THE KM11.

2. W131 — SINGLE HEIGHT MODULE THAT CONTAINS THE INDICATOR LAMPS AND CONTROL SWITCHES WITH FILTERS. IT PLUGS INTO THE W130 WHEN INSTALLED.

3. KD11-A OVERLAY (5509081-0-12)

A PLASTIC ETCHED OVERLAY THAT DEFINES THE INDICATORS AND SWITCHES ON THE W131.

C. INDICATORS

PUPP<08:00> — NINE INDICATOR LAMPS THAT DISPLAY THE CONTENTS OF THE PUPP (PAST MICROPROGRAM POINTER). THEY INDICATE THE ADDRESS OF THE MICROWORD THAT IS CURRENTLY STORED IN THE "UREG" (THIS WORD IS EXECUTED ON THE NEXT CLOCK PULSE)

BUPP<08:00> — NINE INDICATOR LAMPS THAT DISPLAY THE CONTENTS OF THE "UPP" (MICROPROGRAM POINTER).THEY INDICATE THE ADDRESS OF THE MICROWORD THAT IS CURRENTLY BEING READ OUT OF THE ROM. THIS MICROWORD IS LOADED INTO THE UREG ON THE NEXT CLOCK AND THE CONTENTS OF THE UPP GETS TRANSFERRED INTO THE PUPP.

<T,N:C> — FIVE INDICATORS THAT DISPLAY THE STATE OF THE FOLLOWING PSW FLAGS:

"T" BIT
"N" BIT
"Z" BIT
"V" BIT
"C" BIT

MSYN — A SINGLE INDICATOR THAT DISPLAYS THE STATE OF BUS MASTER SYNC.

SSYN — A SINGLE INDICATOR THAT DISPLAYS THE STATE OF BUS SLAVE SYNC.

NOTE:

THE STATE OF ALL INDICATOR LAMPS IS
DEFINED AS FOLLOWS:

"ON" (1), ASSERTED, ACTIVE
"OFF" (0), NEGATED, INACTIVE

D. SWITCHES

MCLK ENAB — WHEN ACTIVE THIS SWITCH DISABLES THE INTERNAL PROCESSOR CLOCK AND ALLOWS TOGGLING A MAINT ENTANCE CLOCK USING THE "MCLK" SWITCH.

MCLK — WHEN ACTIVATED (ON-OFF SEQUENCE) THIS SWITCH GENERATES ONE CLOCK PULSE TO THE KD11-A.

MSTOP — WHEN ACTIVE THIS SWITCH ENABLES TURNING OFF THE PROCESSOR CLOCK WHEN THE CONTENTS OF BUPP<8:0> MATCHES THE ADDRESS CONTAINED IN SR<8:0> IN THE CONSOLE SWITCH REGISTER. WHEN THE CLOCK STOPS, THE CONTENTS OF THE ROM ADDRESS SELECTED BY SR<8:0> IS STORED IN THE "UREG" AND THE ADDRESS ITSELF CONTAINED IN THE "PUPP".

NOTE:

ALL SWITCHES ARE INACTIVE WHEN POSITIONED
TOWARD THE INDICATOR DISPLAY ON THE W131.
AN "ARROW" ETCHED ON THE OVERLAY SIGNIFIES THE
DIRECTION OF THE ACTIVE POSITION.

E. TYPICAL OPERATING PROCEDURES

1. INSTALLATION

A) TURN OFF ALL POWER TO THE KD11-A
B) SLIDE OUT THE KD11-A FROM THE CABINET
C) OPEN THE HINGED COVER ON THE LEFT SIDE
D) PLUG THE W130 INTO SLOT F1
E) PLUG THE W131 INTO THE W130 (WITH OVERLAY ATTACHED)

*********CAUTION*********

INSURE THAT THE HINGED COVER IS SECURED PROPERLY TO PREVENT IT FROM SWINGING FORWARD AND SHORTING THE PRINTED CIRCUIT ETCH ON THE BACK OF THE W131.

D) PLACE ALL THREE SWITCHES ON THE W131 TO "OFF"
E) TURN ON THE KD11-A POWER AND LOAD AND START
THE "DBKDAA" DIAGNOSTIC.

2. OPERATION

A) ESTABLISH A SCOPE LOOP ON THE FAILING TEST
B) CONSULT THE LISTING FOR THAT TEST TO DETERMINE

```
1728                                    IF THE SCOPE SYNC INSTRUCTION IS A SET OR CLEAR
1729                                    CONDITION CODES AND SET UP SR<8:0> ON THE
1730                                    CONSOLE AS FOLLOWS:
1731
1732                                         SET CODES       SR<8:0> = 352
1733                                         CLR CODES       SR<8:0> = 351
1734
1735                                C) PLACE THE "MSTOP" SWITCH IN THE ACTIVE POSITION.
1736                                   THE CLOCK SHOULD STOP AND FREEZE THE ROM WITH THE
1737                                   ADDRESS OF THE FIRST MICROWORD USED TO FETCH THE
1738                                   TARGET INSTRUCTION CONTAINED IN THE "UPP" REG.
1739
1740                                D) PLACE THE "MCLK ENAB" SWITCH ON AND THE "MSTOP"
1741                                   SWITCH OFF.
1742
1743                                E) NOW YOU ARE READY TO "TOGGLE" THROUGH THE ROM
1744                                   SEQUENCE FOR THE TEST INSTRUCTION USING THE "MCLK"
1745                                   SWITCH TO LOCATE AND ISOLATE THE FAILING MICROWORD.
1746                                   EACH TIME THE "MCLK" SWITCH IS TOGGLED THE CONTENTS
1747                                   OF THE "BUPP" AND "PUPP" INDICATORS SHOULD CHANGE
1748                                   TO INDICATE THE ROM SEQUENCE BEING GENERATED.
1749                                   COMPARE THIS SEQUENCE WITH THE CORRECT SEQUENCE
1750                                   INDICATED BY THE MAINTENANCE HEADER INCLUDED IN THE
1751                                   PROGRAM LISTING.
1752                        6.4     UPP MATCH MAINTENANCE FEATURE
1753                                ----------------------------
1754
1755                                      THERE IS A VALUABLE HARDWARE MAINTENANCE AID BUILT
1756                              INTO THE KD11-A LOGIC THAT PROVIDES THE TECHNICIAN WITH A
1757                              METHOD OF ANALYZING THE ROM SEQUENCES BEING GENERATED.
1758                              IT IS CONTAINED ON THE K1 MODULE AND CONSISTS OF A COMP-
1759                              ARATOR CIRCUIT (K1-9 PRINT) THAT ALLOWS TWO UNIQUE LOGIC
1760                              SIGNALS TO BE GENERATED AS A FUNCTION OF THE ROM ADDRESS
1761                              CONTAINED IN THE "UPP" AND THE SETTING OF THE CONSOLE SWITCH
1762                              REGISTER SR<8:0>.
1763
1764
1765                                                 **************
1766                                   SR<8:> ----->*  MATCH     *---> UPP MATCH H
1767                                                *  CIRCUIT   *
1768                                   BUPP<8:0>--->*            *---> P MATCH L
1769                                                **************
1770
1771                              UPP MATCH H       THIS SIGNAL IS ASSERTED WHENEVER A MATCH OCCURS
1772                                                BETWEEN THE CONTENTS OF THE "UPP" AND THE CONT-
1773                                                ENTS OF SR<8:0>. IT CAN BE OBSERVED ON BACK-
1774                                                PLANE PIN C04L2 AND IS USEFUL FOR DETERMINING
1775                                                IF AND WHEN A SPECIFIC ROM WORD IS ACCESSED
1776                                                DURING A PARTICULAR ROM SEQUENCE. IT MAY BE USED
1777                                                AS A SCOPE SYNC TRIGGER OR AS A REFERENCE SIGNAL
1778                                                FOR INVESTIGATING ADDITIONAL CONTROL SIGNALS
1779                                                THAT SHOULD OCCUR DURING A SPECIFIC MICROWORD.
1780
1781                              P MATCH L         THIS SIGNAL WORKS IN CONJUNCTION WITH THE
1782                                                "MSTOP" SWITCH ON THE KM11 MAINTENANCE MODULE
1783                                                TO STOP THE CLOCK AND "FREEZE" THE ROM AT A
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1784
1785
1786
1787
1788
1789
1790
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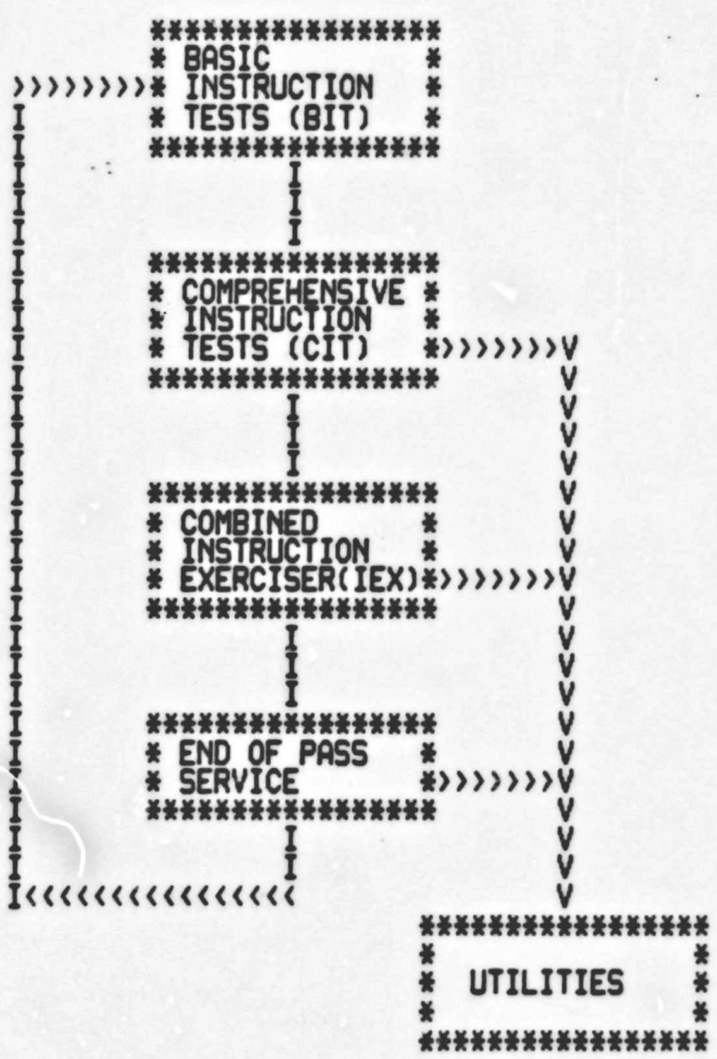
SPECIFIC ROM ADDRESS. AS DESCRIBED IN PARA.
6.3 (E2), IT IS USEFUL FOR INITIALLY STOPPING
THE ROM AT THE CORRECT POINT PRIOR TO SINGLE
CLOCKING ROM SEQUENCES.

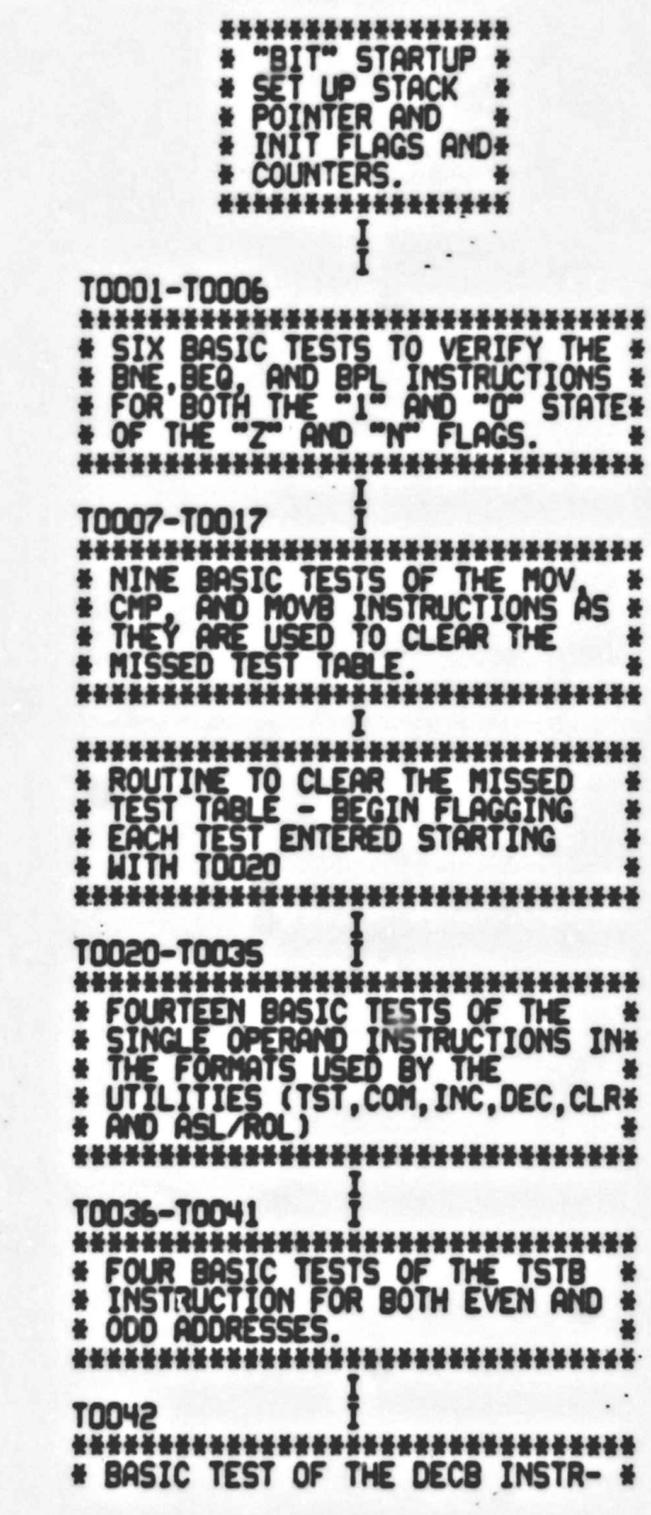
7.0 FLOW CHARTS

7.1 FUNCTIONAL FLOW



7.2 SUB-FUNCTIONAL FLOWS

A. BASIC INSTRUCTION TESTS SECTION



```
                                        * UCTION IN ADDRESS MODE 6      *
                                        * USING THE STACK POINTER.      *
                                        **********************************
                                                      I
```

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1893                                                    I
1894                                    T0043-T0062     I
1895                                    ********************************
1896                                    * SIXTEEN BASIC TESTS TO VERIFY *
1897                                    * THE MOVE INSTRUCTION IN THOSE *
1898                                    * FORMATS USED BY THE UTILITIES *
1899                                    ********************************
1900                                                    I
1901                                    T0063-T0066     I
1902                                    ********************************
1903                                    * FOUR BASIC TESTS OF THE COMP- *
1904                                    * ARE INSTRUCTION IN THOSE FORM-*
1905                                    * ATS USED BY THE UTILITIES     *
1906                                    ********************************
1907                                                    I
1908                                    T0067-T0074     I
1909                                    ********************************
1910                                    * SIX BASIC TESTS OF THE LOGIC  *
1911                                    * INSTRUCTIONS (BIS,BIC,BIT) AS *
1912                                    * USED BY THE UTILITIES.        *
1913                                    ********************************
1914                                                    I
1915                                    T0075-T0076     I
1916                                    ********************************
1917                                    * TWO BASIC TESTS OF THE ADD    *
1918                                    * INSTRUCTIONS AS IT IS USED BY *
1919                                    * THE UTILITIES.                *
1920                                    ********************************
1921                                                    I
1922                                    T0077-T0103     I
1923                                    ********************************
1924                                    * FOUR BASIC TESTS OF THE CMPB  *
1925                                    * INSTRUCTIONS USING BOTH EVEN  *
1926                                    * AND ODD ADDRESSES.            *
1927                                    ********************************
1928                                                    I
1929                                    T0104-T0123     I
1930                                    ********************************
1931                                    * SIXTEEN BASIC TESTS OF THE    *
1932                                    * MOVB INSTRUCTION USING BOTH   *
1933                                    * EVEN AND ODD ADDRESSES AND IN *
1934                                    * ALL ADDRESS MODES USED BY THE *
1935                                    * THE UTILITIES.                *
1936                                    ********************************
1937                                                    I
1938                                    T0124-T0125     I
1939                                    ********************************
1940                                    * TWO TESTS TO VERIFY THE BASIC *
1941                                    * RTS/JSR INSTRUCTIONS AS USED  *
1942                                    * IN THE UTILITIES.             *
1943                                    ********************************
1944                                                    I
1945                                    T0126-T0127     I
1946                                    ********************************
1947                                    * TWO BASIC TESTS OF THE RTI    *
1948                                    * INSTRUCTION.                  *
```

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1949                                  ************************************
1950                                              I
1951
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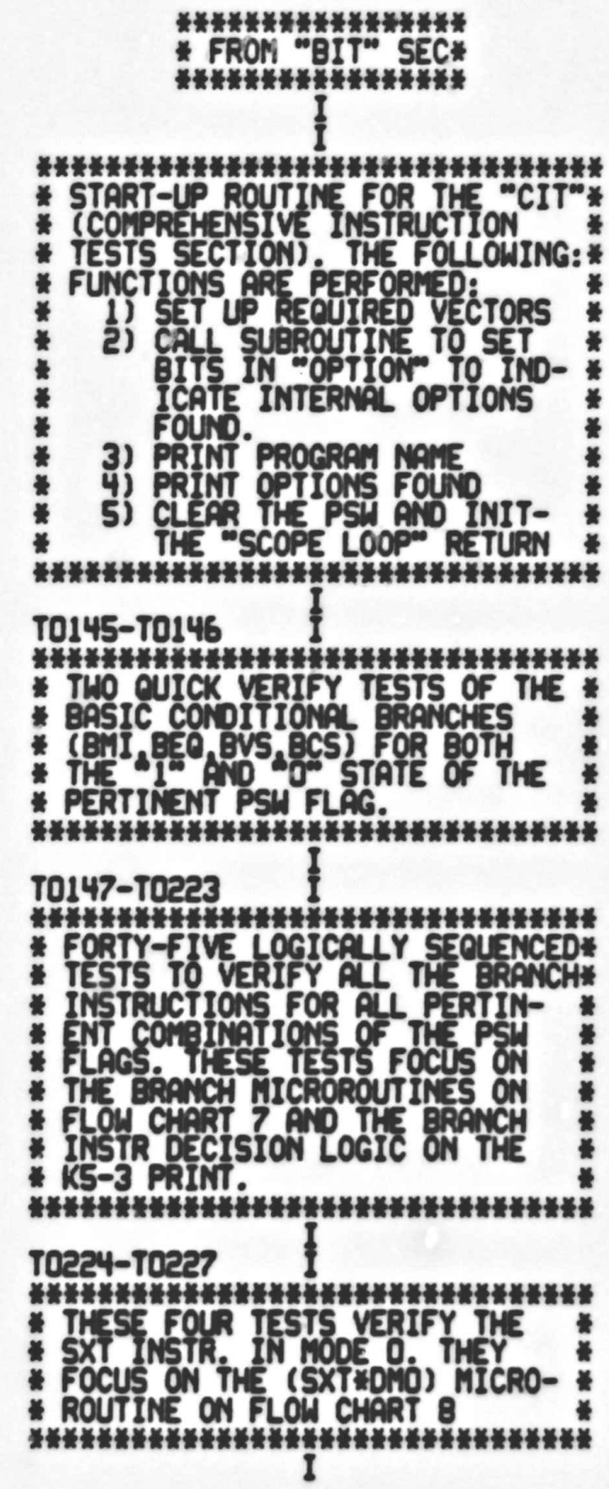
1952                                                    I
1953                                                    I
1954                                    TO130-TO137     I
1955                                    **********************************
1956                                    * EIGHT BASIC TESTS OF THE VAR- *
1957                                    * IOUS TRAP TYPE INSTRUCTIONS   *
1958                                    * TO VERIFY THAT THE UTILITIES  *
1959                                    * CAN BE CALLED VIA THE TRAP    *
1960                                    * MECHANISM. (IOT,TRAP,EMT, AND *
1961                                    * RSVD INSTR AND BUS TIMEOUT    *
1962                                    * TRAPS)                        *
1963                                    **********************************
1964                                                    I
1965                                    TO140-TO144     I
1966                                    **********************************
1967                                    * FIVE BASIC TESTS TO VERIFY THE*
1968                                    * DL11 INTERFACE USED TO REPORT *
1969                                    * ERRORS. THE MAINTENANCE MODE  *
1970                                    * FEATURE IS USED TO TURNAROUND *
1971                                    * AND CHECK AN ALL 1'S ALL 0'S  *
1972                                    * SEQUENCE.                     *
1973                                    **********************************
1974                                                    I
1975                                            ********************
1976                                            * ENTER THE "CIT" *
1977                                            *     SECTION    *
1978                                            ********************
```

B. COMPREHENSIVE INSTRUCTION TESTS SECTION



```
                                    TO230-TO233     I
                                    ********************************
                                    * THESE FOUR TESTS VERIFY THE  *
                                    * SXT INSTR. IN MODE 1 AND 2.  *
                                    * THEY FOCUS ON THE (SXT*-DMO) *
                                    * MICROROUTINE ON FLOW CHART 8 *
                                    * AND THE BUT33 IN ROM LOCATIONS*
                                    * 260 AND 266 ON FLOW CHART 3  *
                                    ********************************
                                                    I
                                    TO234-TO235     I
                                    ********************************
                                    * TWO TESTS TO VERIFY THE SWAB *
                                    * INSTR. IN MODE 0. THEY FOCUS *
                                    * ON THE (SWAB*DMO) MICROROUTINE*
                                    * ON FLOW CHART 7.             *
                                    ********************************
                                                    I
                                    TO236-TO237     I
                                    ********************************
                                    * TWO TESTS TO VERIFY THE SWAB *
                                    * INSTR. IN MODE 1. THEY FOCUS *
                                    * ON THE (SWAB) MICROROUTINE ON *
                                    * FLOW CHART 9                 *
                                    ********************************
                                                    I
                                    TO240-TO243     I
                                    ********************************
                                    * FOUR TESTS TO VERIFY THE NEG *
                                    * INSTR. IN MODE 0 THAT FOCUS ON*
                                    * THE (SOPMORE*DMO*NEG) MICRO-*
                                    * ROUTINE ON FLOW CHART 7.     *
                                    ********************************
                                                    I
                                    TO244-TO247     I
                                    ********************************
                                    * FOUR TESTS TO VERIFY THE NEG *
                                    * INSTRUCTION IN MODE 1 THAT   *
                                    * FOCUS ON THE [(SWAB+SOPMORE) *
                                    * *-DMO*NEG] MICROROUTINE ON   *
                                    * FLOW CHART 9.                *
                                    ********************************
                                                    I
                                    TO250-TO273     I
                                    ********************************
                                    * TWENTY TESTS THAT VERIFY THE *
                                    * ROR/ASR INSTRUCTIONS THAT    *
                                    *FOCUS ON THE (ROTSHF) MICRO-  *
                                    * ROUTINES ON FLOW CHART 9. BOTH*
                                    * WORD AND BYTE OPERATIONS ARE *
                                    * TESTED FOR BOTH EVEN AND ODD *
                                    * ADDRESSES.                   *
                                    ********************************
                                                    I
```

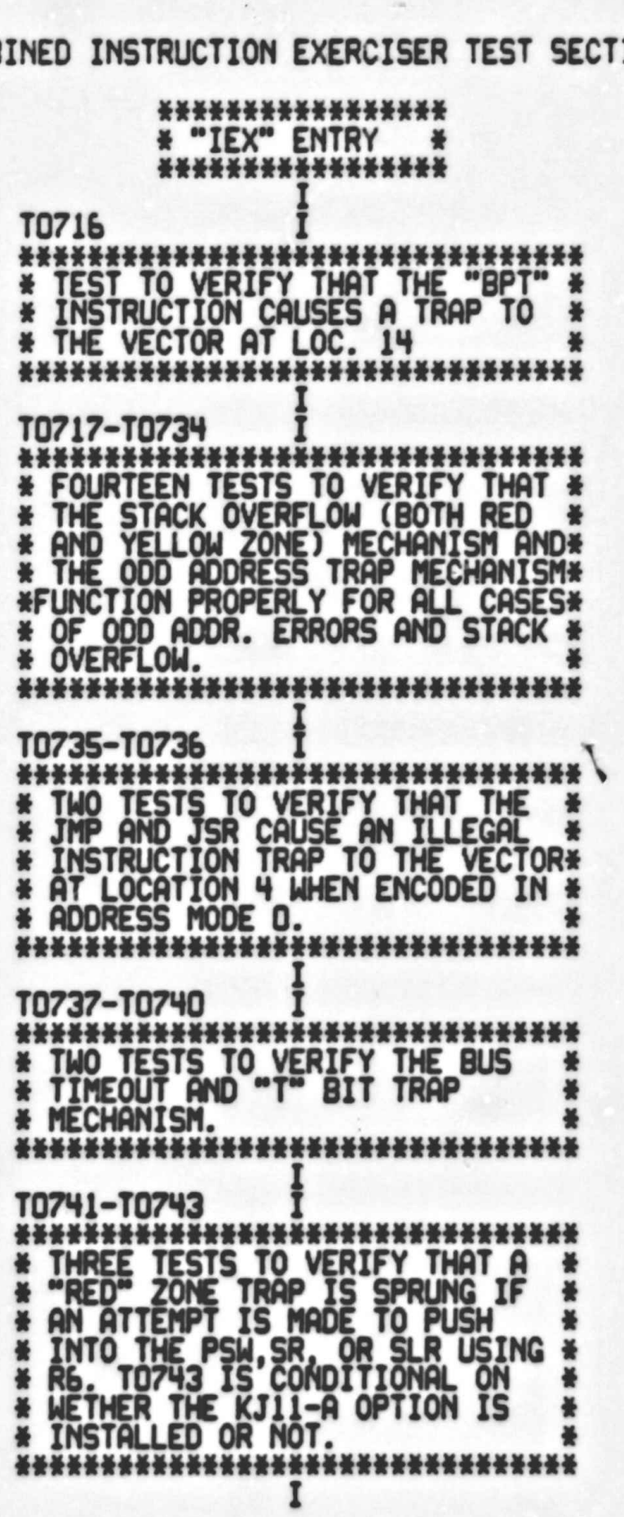
```
2087                                    T0274-T0323     I
2088                                    **********************************
2089                                    * TWENTY FOUR TESTS THAT VERIFY *
2090                                    * ALL SINGLE OPR. INSTR. OTHER  *
2091                                    * THAN SXT,SWAB,NEG,ASR,ROR, OR *
2092                                    * JMP. THEY FOCUS ON THE MODE 0 *
2093                                    * CASE AND THE MICROROUTINE     *
2094                                    * (SOPMORE*DMO*-NEG) ON FLOW    *
2095                                    * CHART 7.                      *
2096                                    **********************************
2097                                                    I
2098                                    T0324-T0353     I
2099                                    **********************************
2100                                    * TWENTY FOUR TESTS SIMILAR TO  *
2101                                    * THE PREVIOUS GROUP EXCEPT     *
2102                                    * THEY HANDLE THE NON MODE 0    *
2103                                    * CASE FOCUSING ON THE (SOPMORE *
2104                                    * +SWAB)*-NEG*-DMO MICROROUTINE *
2105                                    * ON FLOW CHART 9               *
2106                                    **********************************
2107                                                    I
2108                                    T0354-T0370     I
2109                                    **********************************
2110                                    * THIRTEEN TESTS USING THE CLR  *
2111                                    * AND NEG INSTRUCTIONS TO VERIFY*
2112                                    * THE BYTE MICROROUTINES THAT   *
2113                                    * SUPPORT SINGLE OPERAND INSTR- *
2114                                    * UCTIONS FOR BOTH EVEN AND ODD *
2115                                    * ADDRESS CASES.                *
2116                                    **********************************
2117                                                    I
2118                                    T0371-T0417     I
2119                                    **********************************
2120                                    * TWENTY THREE TESTS THAT USE   *
2121                                    * THE ADD INSTRUCTION TO VERIFY *
2122                                    * THE SOURCE AND DESTINATION    *
2123                                    * MICROBRANCHES ON FLOW CHARTS  *
2124                                    * 2 AND 3.                      *
2125                                    **********************************
2126                                                    I
2127                                    T0420-T0427     I
2128                                    **********************************
2129                                    * EIGHT TESTS THAT VERIFY THE   *
2130                                    * XOR INSTRUCTION FOR BOTH THE  *
2131                                    * MODE 0 AND 1 CASES.           *
2132                                    **********************************
2133                                                    I
2134                                    T0430-T0444     I
2135                                    **********************************
2136                                    * THIRTEEN TESTS THAT VERIFY THE*
2137                                    * MICROWORDS UNIQUE TO THE SUB- *
2138                                    * TRACT INSTR. FOCUSING ON ROM  *
2139                                    * LOCATIONS 363,370, AND 365.   *
2140                                    **********************************
2141                                                    I
```

```
                                    TO445-TO452     I
                                    ********************************
                                    * SIX TESTS USING THE NEG INSTR-*
                                    * TO VERIFY FETCH TO DESTINATION*
                                    * MICROBRANCHES FOR SINGLE OPER-*
                                    * ERAND INSTRUCTIONS USING DM2  *
                                    * THRU DM7.                     *
                                    ********************************
                                                    I
                                    TO453-TO536     I
                                    ********************************
                                    * FIFTY TWO MOVE INSTRUCTION    *
                                    * TESTS THAT FOCUS ON ALL THE   *
                                    * POSSIBLE MOV MICROINSTRUCTION *
                                    * SEQUENCES ON FLOW CHART 4 AND *
                                    * ALL MICRBRANCHES ENTERING AND *
                                    * EXITING THIS SHEET.           *
                                    ********************************
                                                    I
                                    TO537-TO602     I
                                    ********************************
                                    * THIRTY SIX TESTS THAT VERIFY  *
                                    * THE BIS,BIC,BIT, AND CMP INSTR*
                                    * UCTIONS IN ALL SOURCE AND DEST*
                                    * MODE COMBINATIONS FOR WORD OPS*
                                    ********************************
                                                    I
                                    TO603-TO616     I
                                    ********************************
                                    * TWELVE TESTS THAT USE THE BIS *
                                    * INSTRUCTION TO VERIFY THE     *
                                    * BYTE MICROROUTINES THAT SUPP- *
                                    * DOUBLE OPERAND INSTRUCTIONS   *
                                    * FOR BOTH THE EVEN AND ODD CASE*
                                    ********************************
                                                    I
                                    TO617-TO634     I
                                    ********************************
                                    * FOURTEEN TESTS THAT VERIFY THE*
                                    * JMP MICROUTINES ON FLOW CHART *
                                    * 5 AND ALL MICROBRANCHES WITH- *
                                    * WITHIN THESE ROUTINES.        *
                                    ********************************
                                                    I
                                    TO635-TO647     I
                                    ********************************
                                    * TEN TESTS TO VERIFY THE JSR   *
                                    * MICROUTINE ON FLOW CHART 5 AND*
                                    * ALL MICROBRANCHES INTO THIS   *
                                    * ROUTINE.                      *
                                    ********************************
                                                    I
                                    TO647-TO654     I
                                    ********************************
                                    * SIX TESTS TO VERIFY THE SOB   *
                                    * INSTRUCTION FOCUSING ON THE   *
```

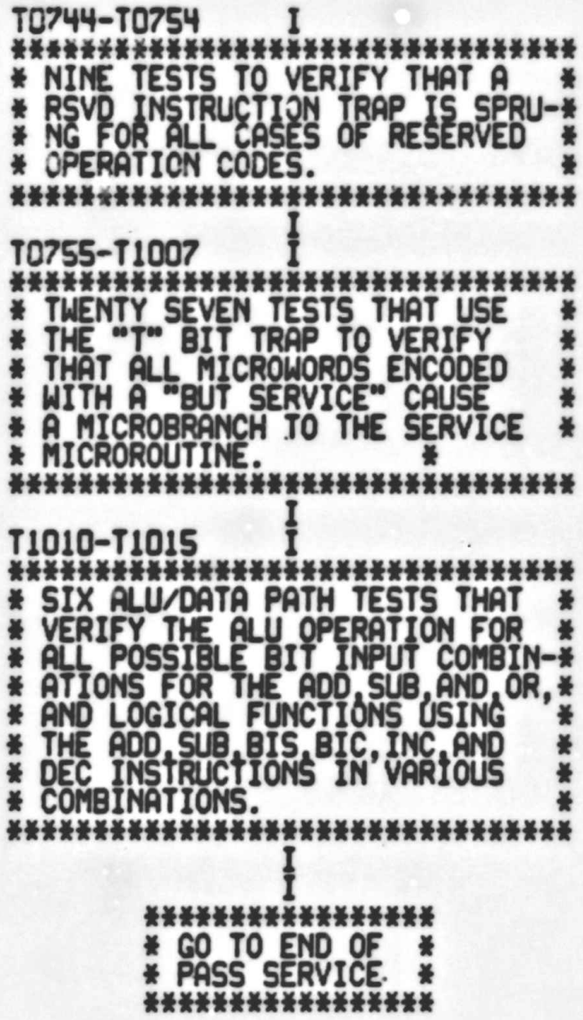
```
                                ;* MICROROUTINES ON FLOW CHART 7 *
                                ;* BOTH THE BRANCH AND NO BRANCH *
                                ;* CASES ARE TESTED.             *
                                ;*********************************
```

```
2202                                    TO655-TO656     I
2203                                    ********************************
2204                                    * TWO TESTS TO VERIFY THE RTS   *
2205                                    * MICROROUTINE ON FLOW CHART 6  *
2206                                    ********************************
2207                                                    I
2208                                    TO657-TO660     I
2209                                    ********************************
2210                                    * TWO TESTS TO VERIFY THE RTT   *
2211                                    * MICROROUTINE ON FLOW CHART 6  *
2212                                    ********************************
2213                                                    I
2214                                    TO661-TO662     I
2215                                    ********************************
2216                                    * TWO TESTS TO VERIFY THE MARK  *
2217                                    * MICROROUTINE ON FLOW CHART 5  *
2218                                    ********************************
2219                                                    I
2220                                    TO663-TO667     I
2221                                    ********************************
2222                                    * FIVE TESTS TO VERIFY THE INT- *
2223                                    * EGRITY OF THE KW11-L LINE     *
2224                                    * CLOCK OPTION. THESE TESTS ARE *
2225                                    * SKIPPED IF THE KW11-L IS NOT  *
2226                                    * INSTALLED.                    *
2227                                    ********************************
2228                                                    I
2229                                    TO670-TO673     I
2230                                    ********************************
2231                                    * FOUR TESTS THAT VERIFY THE    *
2232                                    * RESET AND WAIT INSTRUCTIONS   *
2233                                    * THAT FOCUS ON THE SERVICE MIC-*
2234                                    * RORUTINE ON FLOW CHART 10 AND*
2235                                    * THE RESET MICROROUTINE ON FLOW*
2236                                    * CHART 6.                      *
2237                                    ********************************
2238                                                    I
2239                                    TO674-TO715     I
2240                                    ********************************
2241                                    * EIGHTEEN TESTS THAT VERIFY THE*
2242                                    * PRIORITY ARBITRATION LOGIC    *
2243                                    * FOR BR REQUESTS. THEY FOCUS   *
2244                                    * ON THE SERVICE AND TRAP MICRO-*
2245                                    * ROUTINES ON FLOW CHARTS 10 AND*
2246                                    * 6. SEVERAL OF THESE TESTS MAY *
2247                                    * BE SKIPPED IF THE KW11-L IS   *
2248                                    * NOT INSTALLED.                *
2249                                    ********************************
2250                                                    I
2251                                                    I
2252                                                ****************
2253                                                * GO TO "IEX"   *
2254                                                *   SECTION    *
2255                                                ****************
```

C. COMBINED INSTRUCTION EXERCISER TEST SECTION

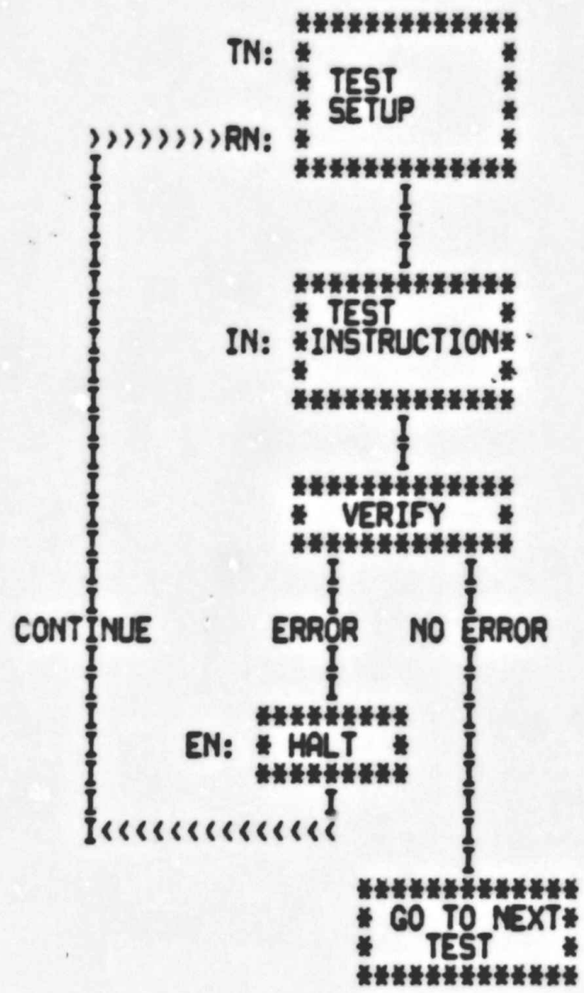


```
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
```



7.3 FUNCTIONAL TEST FLOWS

A. BASIC INSTRUCTION TEST STRUCTURE



NOTES:

1) THE TEST ENTRY IS ALWAYS TAGGED "TN" WHERE "N" IS THE TEST NO. IN OCTAL.
2) THE TEST INSTRUCTION IS ALWAYS TAGGED "IN".
3) THE ERROR HALT IS ALWAYS TAGGED "EN".
4) THE RETURN POINT FOR LOOPING IS ALWAYS TAGGED "RN".
5) IF MORE THAN ONE VERIFICATION IS MADE IN A SINGLE TEST THE ENTRIES TO SUBSEQUENT CHECKS ARE TAGGED "AN" "BN" ETC.
6) IF MORE THAN ONE ERROR HALT IS INCLUDED, SUBSEQUENT ERROR HALTS ARE TAGGED: "E1N", "E2N", E3N", ETC.
7) WHEN AN ERROR HALT OCCURS THE CONSOLE ADDRESS AND DATA DISPLAYS CONVEY THE FOLLOWING INFORMATION:

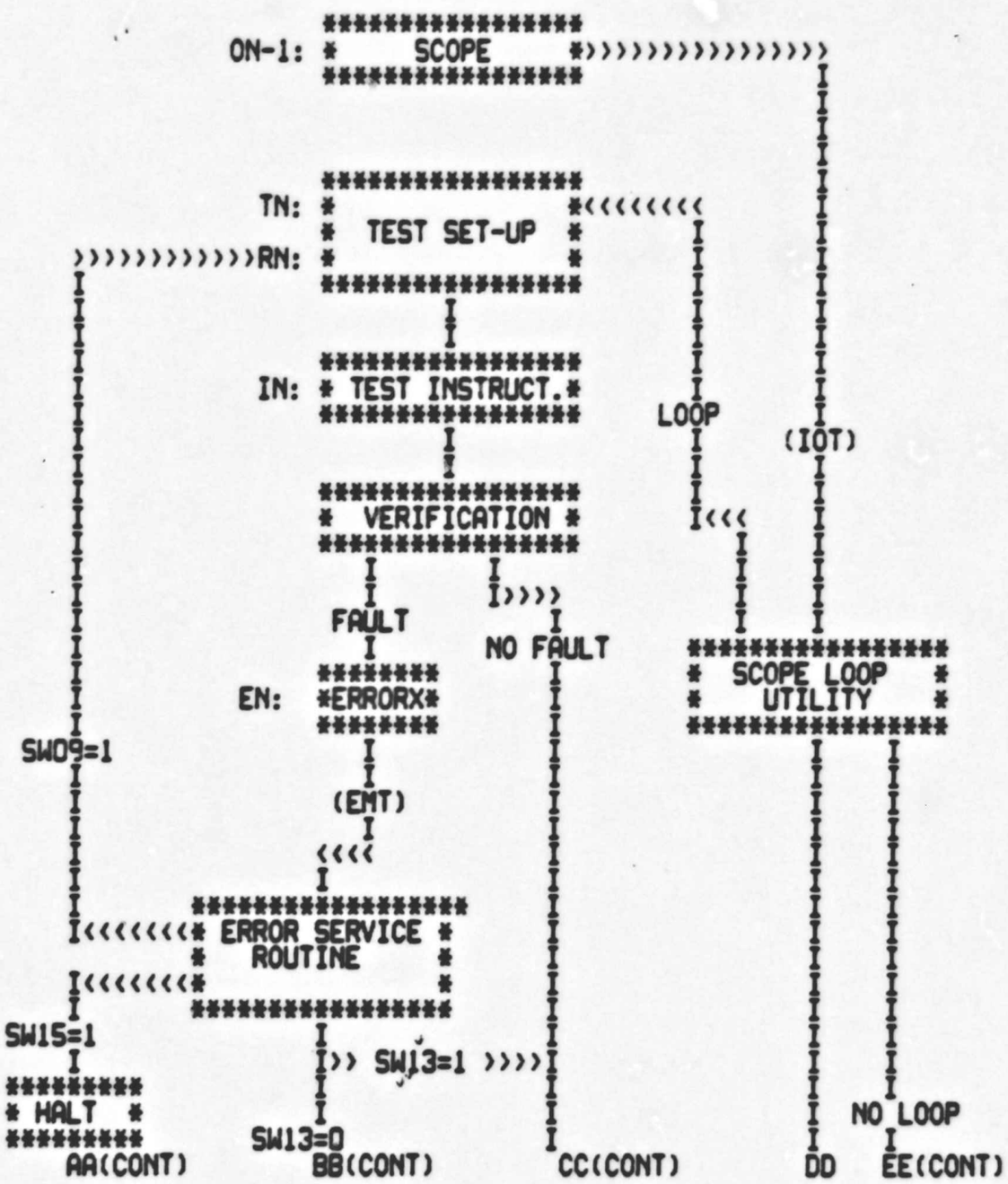
```
2401
2402
2403
2404
2405
2406
2407
2408
2409
2410
2411
2412
2413
```

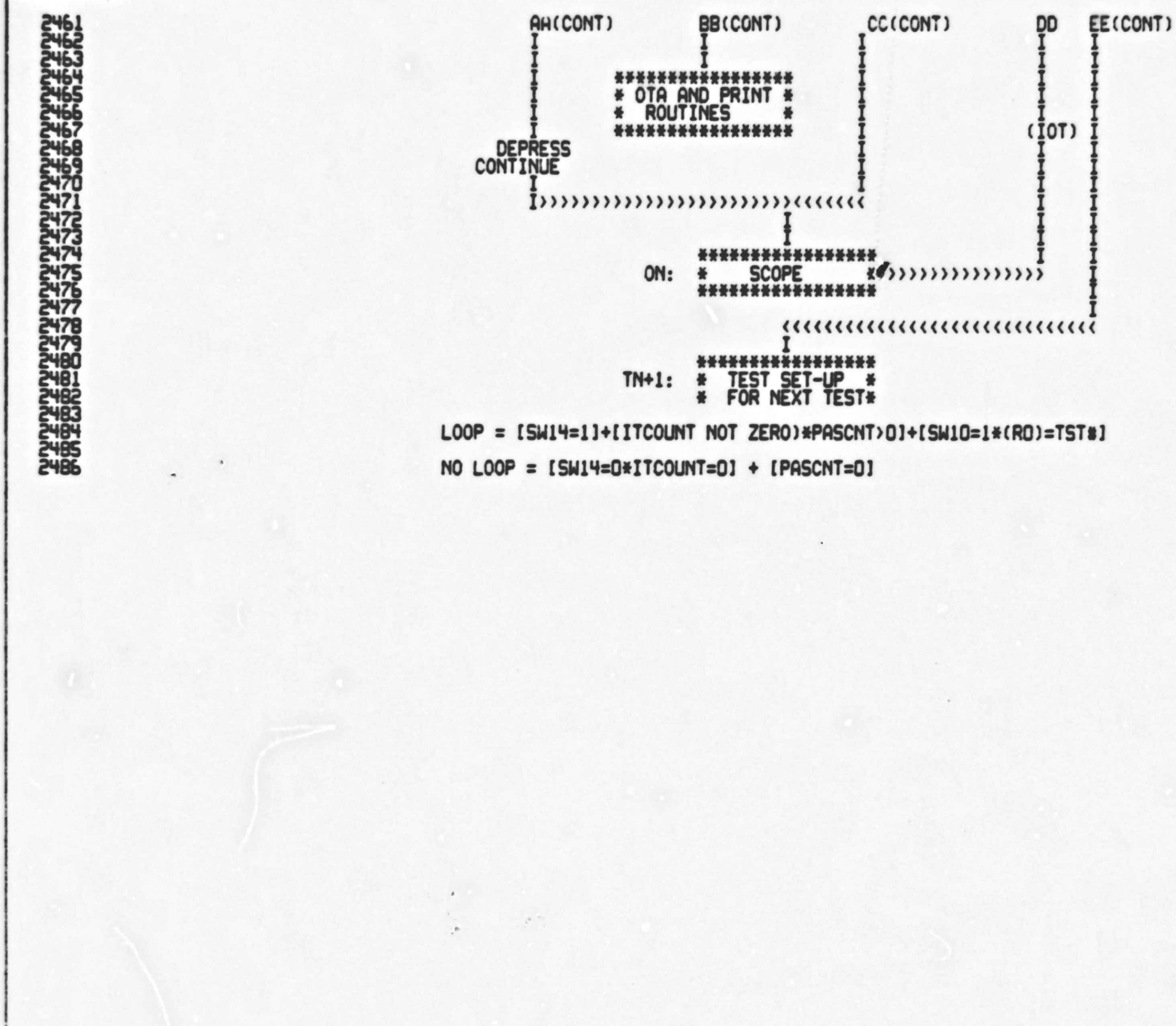
ADDRESS DISPLAY: ADDRESS + 2 OF THE LOCATION CONTAINING THE "HALT"

DATA DISPLAY: TEST NUMBER

8) TO ESTABLISH A CONTINUOUS SCOPE LOOP THE HALT INSTRUCTION MUST BE REPLACED WITH A "000400" (BR .+2) BEFORE DEPRESSING "CONTINUE".

B. COMPREHENSIVE INSTRUCTION TEST STRUCTURE

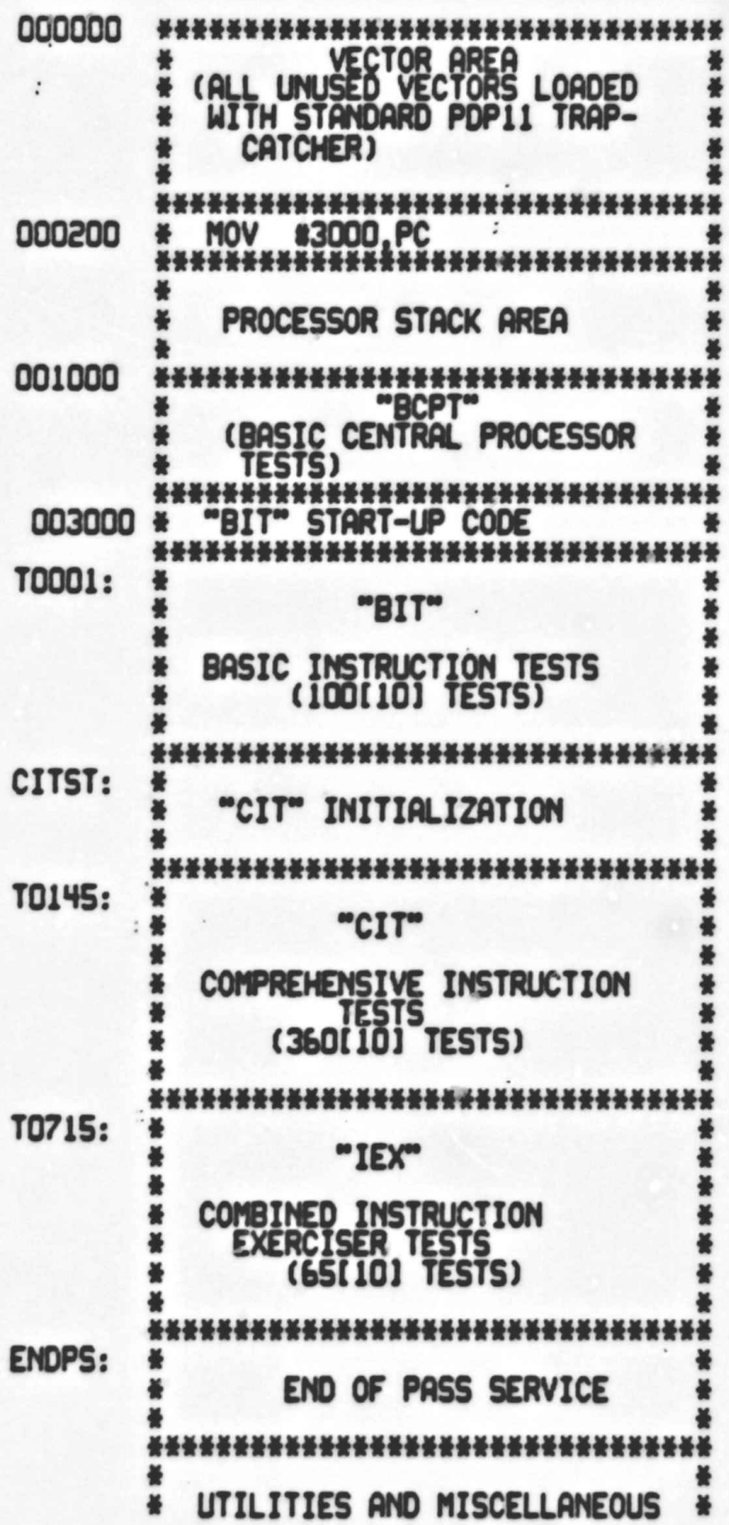




LOOP = [SW14=1]+[ITCOUNT NOT ZERO)*PASCNT>0]+[SW10=1*(R0)=TST#]

NO LOOP = [SW14=0*ITCOUNT=0] + [PASCNT=0]

7.4 CORE MEMORY MAP



```
2543                                    *   SUBROUTINES                 *
2544                                    *                               *
2545                                    *********************************
```

```
2546
2547                                    OPTION:  ***********************************
2548                                             *                                 *
2549                                             *  CONSTANTS, FLAGS, AND          *
2550                                             *   VARIABLES                     *
2551                                             *                                 *
2552                                             ***********************************
2553                                    BELL:    *                                 *
2554                                             *     ASCII MESSAGES              *
2555                                             *                                 *
2556                                             *                                 *
2557                                             ***********************************
2558                                    OBUF:    *                                 *
2559                                             *  COMMON DATA STRUCTURES         *
2560                                             *                                 *
2561                                             *                                 *
2562                                             ***********************************
```

```
                                8.0     SUB-TITLE INDEX OF TESTS
                                        ------------------------

                                        REFER TO THE TABLE OF CONTENTS IN THE LISTING FOR A DETAILED
                                        SUB-TITLE INDEX OF TESTS. THIS TABLE LISTS ALL TESTS SEQ-
                                        UENTIALLY BY TEST NO. WITH A BRIEF DESCRIPTION OF THE FUNCTION
                                        OF EACH TEST. THE LEFT HAND COLUMN CONTAINS LINE NUMBERS THAT
                                        FACILITATE RAPIDLY LOCATING ANY PARTICULAR TEST WITHIN THE
                                        LISTING.


                                .ENABLE ABS

000000                          .=0

                                ; ************************************************************************
                                                .SBTTL STANDARD PDP11 "TRAP CATCHER"
                                ; ************************************************************************

                                ;WHEN THE PROGRAM IS LOADED, LOCATIONS 000000-000776 (VECTOR AREA)
                                ;GET LOADED WITH THE STANDARD PDP11 "TRAP CATCHER". THE FIRST WORD
                                ;IN EACH VECTOR (NEW PC) IS SET UP TO POINT TO THE SECOND WORD WHICH
                                ;CONTAINS A "HALT" INSTRUCTION. ANY UNEXPECTED TRAP OR INTERRUPT
                                ;DIRECTED TO A VECTOR THAT HAS NOT BEEN INITIALIZED BY THE PROGRAM TO
                                ;POINT TO AN APPROPRIATE SERVICE ROUTINE WILL CAUSE THE PROGRAM TO HALT.
                                ;AFTER THE HALT THE FOLLOWING ERROR INFORMATION IS AVAILABLE FOR
                                ;DETAILED ERROR ANALYSIS BY THE SERVICE TECHNICIAN:

                                        ;ADDRESS DISPLAY-       V+4 - WHERE "V" IS THE VECTOR THE
                                                                ;TRAP OR INTR. TRAPPED TO.

                                        ;DATA DISPLAY-          NUMBER OF THE TEST BEING EXECUTED WHEN
                                                                ;THE TRAP WAS SPRUNG.

                                        ;CONTENTS OF THE SP-    MEMORY ADDRESS CONTAINING THE CONTENTS
                                                                ;OF THE PC WHEN THE TRAP WAS SPRUNG

                                ;"TRAP CATCHER" HALTS ARE CONSIDERED TO BE CATASTROPHIC ERRORS THAT
                                ;NORMALLY PRECLUDE CONTINUING ON IN THE PROGRAM FROM THE POINT OF THE
                                ;ERROR. THE PROGRAM MUST BE RESTARTED OR PROPER MODIFICATIONS MADE
                                ;BASED ON THE ANALYSIS OF THE ERROR INFORMATION.

000000  000002                  .+2
000002  000000                  HALT

                                ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                                ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                                ;TO THE BUS ERROR SERVICE ROUTINE AT "BERR:" WITH A PRIORITY OF 7

000004  000006                  .+2
000006  000000                  HALT

                                ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                                ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                                ;TO THE RSVD INSTR. TRAP SERVICE ROUTINE AT "RSERR:" WITH A PRIORITY OF 7
```

```
2619
2620  000010  000012                    .+2
2621  000012  000000                    HALT
2622  000014  000016                    .+2
2623  000016  000000                    HALT
2624
2625                              ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
2626                              ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
2627                              ;TO THE SCOPE  SERVICE ROUTINE AT "SCOPEB:" WITH A PRIORITY OF 0
2628
2629  000020  000022                    .+2
2630  000022  000000                    HALT
2631
2632                              ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
2633                              ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
2634                              ;TO THE POWER FAIL SERVICE ROUTINE AT "PDWN:" WITH A PRIORITY OF 7
2635
2636  000024  000026                    .+2
2637  000026  000000                    HALT
2638
2639                              ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
2640                              ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
2641                              ;TO THE  ERROR SERVICE ROUTINE AT "ERRB:" WITH A PRIORITY OF 0
2642
2643  000030  000032                    .+2
2644  000032  000000                    HALT
2645
2646                              ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
2647                              ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
2648                              ;TO THE PRINT SERVICE ROUTINE AT "PRINT:" WITH A PRIORITY OF 0
2649
2650  000034  000036                    .+2
2651  000036  000000                    HALT
2652  000040  000042                    .+2
2653  000042  000000                    HALT
2654  000044  000046                    .+2
2655  000046  000000                    HALT
2656  000050  000052                    .+2
2657  000052  000000                    HALT
2658  000054  000056                    .+2
2659  000056  000000                    HALT
2660  000060  000062                    .+2
2661  000062  000000                    HALT
2662  000064  000066                    .+2
2663  000066  000000                    HALT
2664  000070  000072                    .+2
2665  000072  000000                    HALT
2666  000074  000076                    .+2
2667  000076  000000                    HALT
2668  000100  000102                    .+2
2669  000102  000000                    HALT
2670  000104  000106                    .+2
2671  000106  000000                    HALT
2672  000110  000112                    .+2
2673  000112  000000                    HALT
2674  000114  000116                    .+2
```

```
 2675  000116  000000                          HALT
 2676  000120  000122                          .+2
 2677  000122  000000                          HALT
 2678  000124  000126                          .+2
 2679  000126  000000                          HALT
 2680  000130  000132                          .+2
 2681  000132  000000                          HALT
 2682  000134  000136                          .+2
 2683  000136  000000                          HALT
 2684  000140  000142                          .+2
 2685  000142  000000                          HALT
 2686  000144  000146                          .+2
 2687  000146  000000                          HALT
 2688  000150  000152                          .+2
 2689  000152  000000                          HALT
 2690  000154  000156                          .+2
 2691  000156  000000                          HALT
 2692  000160  000162                          .+2
 2693  000162  000000                          HALT
 2694  000164  000166                          .+2
 2695  000166  000000                          HALT
 2696  000170  000172                          .+2
 2697  000172  000000                          HALT
 2698  000174  000176                          .+2
 2699  000176  000000                          HALT
 2700  000200  012707  003000                  MOV     #3000,PC        ;GO START UP AT LOC. 3000
 2701  000204  000206                          .+2
 2702  000206  000000                          HALT
 2703  000210  000212                          .+2
 2704  000212  000000                          HALT
 2705  000214  000216                          .+2
 2706  000216  000000                          HALT
 2707  000220  000222                          .+2
 2708  000222  000000                          HALT
 2709  000224  000226                          .+2
 2710  000226  000000                          HALT
 2711  000230  000232                          .+2
 2712  000232  000000                          HALT
 2713  000234  000236                          .+2
 2714  000236  000000                          HALT
 2715  000240  000242                          .+2
 2716  000242  000000                          HALT
 2717  000244  000246                          .+2
 2718  000246  000000                          HALT
 2719  000250  000252                          .+2
 2720  000252  000000                          HALT
 2721  000254  000256                          .+2
 2722  000256  000000                          HALT
 2723  000260  000262                          .+2
 2724  000262  000000                          HALT
 2725  000264  000266                          .+2
 2726  000266  000000                          HALT
 2727  000270  000272                          .+2
 2728  000272  000000                          HALT
 2729  000274  000276                          .+2
 2730  000276  000000                          HALT
```

```
2731   000300  000302                          .+2
2732   000302  000000                          HALT
2733   000304  000306                          .+2
2734   000306  000000                          HALT
2735   000310  000312                          .+2
2736   000312  000000                          HALT
2737   000314  000316                          .+2
2738   000316  000000                          HALT
2739   000320  000322                          .+2
2740   000322  000000                          HALT
2741   000324  000326                          .+2
2742   000326  000000                          HALT
2743   000330  000332                          .+2
2744   000332  000000                          HALT
2745   000334  000336                          .+2
2746   000336  000000                          HALT
2747   000340  000342                          .+2
2748   000342  000000                          HALT
2749   000344  000346                          .+2
2750   000346  000000                          HALT
2751   000350  000352                          .+2
2752   000352  000000                          HALT
2753   000354  000356                          .+2
2754   000356  000000                          HALT
2755   000360  000362                          .+2
2756   000362  000000                          HALT
2757   000364  000366                          .+2
2758   000366  000000                          HALT
2759   000370  000372                          .+2
2760   000372  000000                          HALT
2761   000374  000376                          .+2
2762   000376  000000                          HALT
2763   000400  000402                          .+2
2764   000402  000000                          HALT
2765   000404  000406                          .+2
2766   000406  000000                          HALT
2767   000410  000412                          .+2
2768   000412  000000                          HALT
2769   000414  000416                          .+2
2770   000416  000000                          HALT
2771   000420  000422                          .+2
2772   000422  000000                          HALT
2773   000424  000426                          .+2
2774   000426  000000                          HALT
2775   000430  000432                          .+2
2776   000432  000000                          HALT
2777   000434  000436                          .+2
2778   000436  000000                          HALT
2779   000440  000442                          .+2
2780   000442  000000                          HALT
2781   000444  000446                          .+2
2782   000446  000000                          HALT
2783   000450  000452                          .+2
2784   000452  000000                          HALT
2785   000454  000456                          .+2
2786   000456  000000                          HALT
```

```
2787  000460  000462                  .+2
2788  000462  000000                  HALT
2789  000464  000466                  .+2
2790  000466  000000                  HALT
2791  000470  000472                  .+2
2792  000472  000000                  HALT
2793  000474  000476                  .+2
2794  000476  000000                  HALT
2795  000500  000502                  .+2
2796  000502  000000                  HALT
2797  000504  000506                  .+2
2798  000506  000000                  HALT
2799  000510  000512                  .+2
2800  000512  000000                  HALT
2801  000514  000516                  .+2
2802  000516  000000                  HALT
2803  000520  000522                  .+2
2804  000522  000000                  HALT
2805  000524  000526                  .+2
2806  000526  000000                  HALT
2807  000530  000532                  .+2
2808  000532  000000                  HALT
2809  000534  000536                  .+2
2810  000536  000000                  HALT
2811  000540  000542                  .+2
2812  000542  000000                  HALT
2813  000544  000546                  .+2
2814  000546  000000                  HALT
2815  000550  000552                  .+2
2816  000552  000000                  HALT
2817  000554  000556                  .+2
2818  000556  000000                  HALT
2819  000560  000562                  .+2
2820  000562  000000                  HALT
2821  000564  000566                  .+2
2822  000566  000000                  HALT
2823  000570  000572                  .+2
2824  000572  000000                  HALT
2825  000574  000576                  .+2
2826  000576  000000                  HALT
2827  000600  000602                  .+2
2828  000602  000000                  HALT
2829  000604  000606                  .+2
2830  000606  000000                  HALT
2831  000610  000612                  .+2
2832  000612  000000                  HALT
2833  000614  000616                  .+2
2834  000616  000000                  HALT
2835  000620  000622                  .+2
2836  000622  000000                  HALT
2837  000624  000626                  .+2
2838  000626  000000                  HALT
2839  000630  000632                  .+2
2840  000632  000000                  HALT
2841  000634  000636                  .+2
2842  000636  000000                  HALT
```

```
 2843  000640  000642                    .+2
 2844  000642  000000                    HALT
 2845  000644  000646                    .+2
 2846  000646  000000                    HALT
 2847  000650  000652                    .+2
 2848  000652  000000                    HALT
 2849  000654  000656                    .+2
 2850  000656  000000                    HALT
 2851  000660  000662                    .+2
 2852  000662  000000                    HALT
 2853  000664  000666                    .+2
 2854  000666  000000                    HALT
 2855  000670  000672                    .+2
 2856  000672  000000                    HALT
 2857  000674  000676                    .+2
 2858  000676  000000                    HALT
 2859  000700  000702                    .+2
 2860  000702  000000                    HALT
 2861  000704  000706                    .+2
 2862  000706  000000                    HALT
 2863  000710  000712                    .+2
 2864  000712  000000                    HALT
 2865  000714  000716                    .+2
 2866  000716  000000                    HALT
 2867  000720  000722                    .+2
 2868  000722  000000                    HALT
 2869  000724  000726                    .+2
 2870  000726  000000                    HALT
 2871  000730  000732                    .+2
 2872  000732  000000                    HALT
 2873  000734  000736                    .+2
 2874  000736  000000                    HALT
 2875  000740  000742                    .+2
 2876  000742  000000                    HALT
 2877  000744  000746                    .+2
 2878  000746  000000                    HALT
 2879  000750  000752                    .+2
 2880  000752  000000                    HALT
 2881  000754  000756                    .+2
 2882  000756  000000                    HALT
 2883  000760  000762                    .+2
 2884  000762  000000                    HALT
 2885  000764  000766                    .+2
 2886  000766  000000                    HALT
 2887  000770  000772                    .+2
 2888  000772  000000                    HALT
 2889  000774  000776                    .+2
 2890  000776  000000                    HALT
```

```
                                ; ************************************************************************
                                ;                       PROGRAM DEFINITIONS
                                ; ************************************************************************

                                        ;GENERAL REGISTER DEFINITIONS

000000                                  R0 = %0
000001                                  R1 = %1
000002                                  R2 = %2
000003                                  R3 = %3
000004                                  R4 = %4
000005                                  R5 = %5
000006                                  SP = %6
000007                                  PC = %7

                                        ;DEFINITIONS FOR KD11-A PROCESSOR STATUS WORD AND CONSOLE SWITCH REGISTER

177570                                  SR = 177570             ;CONSOLE SWITCH REG. ADDR
177776                                  PSW = 177776            ;PROCESSOR STATUS REG. ADDR

                                        ;DEFINITIONS FOR CONSOLE SWITCH REG. - BIT POSITIONS

100000                                  SW15 = 100000
040000                                  SW14 = 040000
020000                                  SW13 = 020000
010000                                  SW12 = 010000
004000                                  SW11 = 004000
002000                                  SW10 = 002000
001000                                  SW09 = 001000

                                        ;IOT USED TO CALL "SCOPE" LOOP UTILITY

000004                                  SCOPE = IOT

                                        ;EMT USED TO CALL "ERROR" SERVICE ROUTINE

104000                                  ERROR=EMT               ;PRINT 8 COLUMNS
104001                                  ERROR1 = EMT+1          ;PRINT COLUMN 1 ONLY
104002                                  ERROR2=EMT+2            ;PRINT COLUMNS 1 AND 2
104003                                  ERROR3 = EMT+3          ;PRINT COLUMNS 1,2,3
104004                                  ERROR4 = EMT+4          ;PRINT COLUMNS 1,2,3,4
104005                                  ERROR5 = EMT+5          ;PRINT COLUMNS 1,2,3,4,5
104006                                  ERROR6 = EMT+6          ;PRINT COLUMNS 1,2,3,4,5,6
104007                                  ERROR7 = EMT+7          ;PRINT COLUMNS 1,2,3,4,5,6,7

                                        ;TRAP USED TO CALL THE PRINT UTILITY

104400                                  TYPE = TRAP

177546                                  LKCSR=  177546          ;KW11-L LINE CLOCK ADDRESS

                                        ;ADDRESS ASSIGNMENTS FOR DL11 CONSOLE TERMINAL INTERFACE

177560                                  RCSR=177560             ;RCVR. CONTROL / STATUS REG. ADDRESS
177562                                  RDBR = 177562           ;RECEIVER DATA BUFFER REG. ADDR.
```

```
2947            177564                          XCSR = 177564           ;TRANSMITTER CONTROL / STATUS REG. ADDR
2948            177566                          XDBR = 177566           ;TRANSMIT DATA BUFFER REG. ADDR.
2949            001000                  .=1000
2950
2951            001000                          STACKL=001000           ;TOP OF STACK FOR LOWER TESTS
```

```
2952                                                    ;//////////////////////
2953                                                    ;  "BCPT" TESTS      /
2954                                                    ;//////////////////////
2955
2956                                    ; ***************************************************************************
2957                                            .SBTTL BT001 "BR" TEST -POSITIVE OFFSET
2958                                    ; ***************************************************************************
2959
2960                                    ;MICROPROGRAMMING / LOGIC INFORMATION
2961
2962                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
2963
2964                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
2965
2966                                    ;EXEC:          [341]ALUC=LHLLH :[016]D=001004
2967
2968                                    ;CODES:         N/A     /       N:C=0000
2969
2970                                    ;SYNC:          N/A     T=1.76 USEC
2971
2972                                    ;KEY SIG:       K5-3 BR INSTR L / K5-3 TRUE BR L / K3-3 SM=0 L / K3-3 IR(14:12)=0 L
2973
2974  001000  000401                    BT001:  BR      BT002           ;TEST THE BR FORWARD
2975
2976  001002  000000                    E001:   HALT                    ;BR FAILED TO LOAD PC PROPERLY
2977
```

```
2978                            ; ************************************************************************
2979                                    .SBTTL BT002 "BR" TEST - NEGATIVE OFFSET
2980                            ; ************************************************************************
2981
2982                            ;MICROPROGRAMMING / LOGIC INFORMATION
2983
2984                            ;ROM SEQ:       [111,340,341,016] FC 1,7
2985
2986                            ;ACT BUTS:      37[004]100,111 / 16[340]016,016
2987
2988                            ;EXEC:          [341]ALUC=LHLLH :[016]D=001006
2989
2990                            ;CODES:         N/A     /       N:C=0000
2991
2992                            ;SYNC:          N/A     T=1.76 USEC
2993
2994                            ;KEY SIG:       K5-3 BR INSTR L / K5-3 TRUE BR L / K3-3 SM=0 L / K3-3 IR(14:12)=0 L
2995
2996  001004  000402            BT002:  BR      I002            ;GO TO TEST INSTRUCTION
2997
2998  001006  000403            A002:   BR      BT003           ;GO TO NEXT TEST
2999
3000  001010  000000            EX002:  HALT                    ;JUST IN CASE
3001
3002  001012  000775            I002:   BR      A002            ;TEST THE BR - NEG. OFFSET
3003
3004  001014  000000            E2002:  HALT                    ;BR FAILED WITH NEG. OFFSET
3005
```

```
                                ; ********************************************************************************
                                        .SBTTL BT003 "BASIC COND. BR" TEST - FLAGS CLEARED
                                ; ********************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (BMI,BEQ,BVS)

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N/A     /       N:C=0000

                                ;SYNC:          N/A     T=1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L / (BMI)K3-3 SM=0 L / (BEQ)K3-3 SM=1 L / (BVS)K3-3 SM=2 L
                                                ; (BMI,BVS)K3-4 IR15 L

001016  100403          BT003:  BMI     E003            ;BR IF "N" SET
001020  001402                  BEQ     E003            ;BR IF "Z" SET
001022  102401                  BVS     E003            ;BR IF "V" SET
001024  103002                  BCC     BT004           ;BR IF "C" CLEAR

001026  000000          E003:   HALT                    ;ERROR - ONE OF THE ABOVE BR'S FAILED
                                                        ;OR THE FLAGS FAILED TO CLEAR ON "START"
001030  000772                  BR      BT003           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT004 "SCC AND COND. BR'S" TEST - FLAGS SET
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (SCC)

                                ;ROM SEQ:       [117,352,016] FC 1,7

                                ;ACT BUTS:      37[004]100,117 / 16[117]016,016

                                ;EXEC:          [117]ALUC=HHLHH,[352]ALUC=HHHHL :[016]D=000017

                                ;CODES:         [352]SPS=3      /       N:C=1111

                                ;SYNC:          BOSJ2   (+)     T=1.72 USEC

                                ;KEY SIG:       K3-6 CC INSTR H / K3-6 I1KO(CINSTR) L / K3-3 IRO4(1) H

001032  000277                 BT004:  SCC                             ;MAKE N:C=1111

001034  100003                 I004:   BPL     E004                    ;BR IF "N" FAILED TO SET
001036  001002                         BNE     E004                    ;BR IF "Z" FAILED TO SET
001040  102001                         BVC     E004                    ;BR IF "V" FAILED TO SET
001042  103402                         BCS     BT005                   ;BR IF "C" SET OK

001044  000000                 E004:   HALT                            ;ERROR - ONE OF THE ABOVE BR'S FAILED
                                                                        ;OR THA SCC FAILED TO SET ALL THE FLAGS
001046  000771                         BR      BT004                   ;LOCK ON HARD ERROR
```

```
3063                                    ; ***************************************************************************
3064                                          .SBTTL BT005 "CCC AND COND. BR'S" TEST - FLAGS CLEARED
3065                                    ; ***************************************************************************
3066
3067                                    ;MICROPROGRAMMING / LOGIC INFORMATION (CCC)
3068
3069                                    ;ROM SEQ:       [116,350,351,016] FC 1,7
3070
3071                                    ;ACT BUTS:      37[004]100,116 / 16[350]016,016
3072
3073                                    ;EXEC:          [116,351]ALUC=HHLHH,[350]ALUC=HLHLH     :[016]D=000000
3074
3075                                    ;CODES:         [351]SPS=3      /       N:C=0000
3076
3077                                    ;SYNC:          B05J2   (+)     T=2.02 USEC
3078
3079                                    ;KEY SIG:       K3-6 CC INSTR H
3080
3081  001050  000257                    BT005:  CCC                     ;MAKE N:C=0000
3082
3083  001052  100403                    I005:   BMI     E005            ;BR IF "N" STILL SET
3084  001054  001402                            BEQ     E005            ;BR IF "Z" STILL SET
3085  001056  102401                            BVS     E005            ;BR IF "V" STILL SET
3086  001060  103002                            BCC     BT006           ;BR IF "C" GOT CLEARED
3087
3088  001062  000000                    E005:   HALT                    ;ERROR - ONE OF THE ABOVE BR'S FAILED
3089                                                                    ;OR THE CCC FAILED TO CLEAR ALL FLAGS
3090  001064  000771                            BR      BT005           ;LOCK ON HARD ERROR
3091
```

```
3092                                    ; ************************************************************************
3093                                          .SBTTL BT006 "CLR  %R" TEST - SETS THE "Z" BIT
3094                                    ; ************************************************************************
3095
3096                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3097
3098                                    ;ROM SEQ:       [104,373,360,001] FC 1,7,8
3099
3100                                    ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
3101
3102                                    ;EXEC:          [104]ALUC=HLLHH :[373]D=000000
3103
3104                                    ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=0100
3105
3106                                    ;SYNC:          B05J2   (-)     T=1 USEC
3107
3108                                    ;KEY SIG:       K3-4 CLR L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3109
3110  001066  000257                    BT006:  CCC                     ;MAKE N:C=0000
3111
3112  001070  005000                    I006:   CLR     R0              ;TEST THE CLR - IT SHOULD SET "Z"
3113
3114  001072  001402                            BEQ     BT007           ;BR IF CLR SET "Z"
3115
3116  001074  000000                    E006:   HALT                    ;ERROR - CLR FAILED TO SET "Z"
3117  001076  000773                            BR      BT006           ;LOCK ON HARD ERROR
3118
```

```
                                ; ************************************************************************
                                ;       .SBTTL BT007 "TST  %R" TEST - USING THE CLR
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,362,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373]D=000000

                                ;CODES:         [373]SPS=1,[362]SPS=3   /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-4 TST L / K3-4 OVLAP INSTR H

001100  005000                  BT007:  CLR     R0              ;MAKE [R0] = 000000
001102  000257                          CCC                     ;MAKE N:C=0000

001104  005700                  I007:   TST     R0              ;TEST THE TST - IT SHOULD SET "Z"

001106  001402                          BEQ     BT010           ;BR IF "Z" SET OK

001110  000000                  E007:   HALT                    ;ERROR - CLR FAILED TO LOAD R0 WITH
                                                                ;ALL ZEROES OR TST FAILED
001112  000772                          BR      BT007           ;LOCK ON HARD ERROR
```

```
3148                            ; ************************************************************************
3149                                  .SBTTL BT010 "COM  %R" TEST - SHOULD SET "N" AND "C"
3150                            ; ************************************************************************
3151
3152                            ;MICROPROGRAMMING / LOGIC INFORMATION
3153
3154                            ;ROM SEQ:       [104,373,360,001] FC 1,7,8
3155
3156                            ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
3157
3158                            ;EXEC:          [104]ALUC=HLLLL :[373]D=177777
3159
3160                            ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=1001
3161
3162                            ;SYNC:          B05J2   (-)     T=1 USEC
3163
3164                            ;KEY SIG:       K3-4 COM L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3165
3166  001114  005000            BT010:  CLR     R0              ;MAKE [R0] = 000000
3167  001116  000257                    CCC                     ;MAKE N:C=0000
3168
3169  001120  005100            I010:   COM     R0              ;TEST THE COM - [R0] S/B = 177777
3170
3171  001122  100001                    BPL     E010            ;BR IF "N" FAILED TO SET
3172  001124  103402                    BCS     BT011           ;BR IF "C" SET OK
3173
3174  001126  000000            E010:   HALT                    ;ERROR - COM FAILED
3175  001130  000771                    BR      BT010           ;LOCK ON HARD ERROR
3176
```

```
                                ; ************************************************************************
                                        .SBTTL BTO11 "COM  %R AND ADC  %R" TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (COM  %O)

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLLL :[373]D=177777
                                ;                          (ADC) :[373]D=000000

                                ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=1001
                                ;                                       (ADC)   N:C=0101

                                ;SYNC:          BOSJ2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-4 COM L / K3-4 OVLAP INSTR H
                                ;       (ADC)   K3-3 DM=0 L / K3-4 ADC L / K3-4 OVLAP INSTR H / K3-8 CIN00 L

001132  005000          BTO11: CLR     R0              ;MAKE [R0] = 000000
001134  000257                 CCC                     ;MAKE N:C=0000

001136  005100          IO11:  COM     R0              ;TEST THE COM - [R0] S/B = 177777
001140  005500                 ADC     R0              ;TEST THE ADC - [R0] S/B = 000000

001142  001001                 BNE     EO11            ;BR IF "Z" DID NOT SET
001144  103402                 BCS     BTO12           ;BR IF "C" SET OK

001146  000000          EO11:  HALT                    ;ERROR - COM OR ADC FAILED
001150  000770                 BR      BTO11           ;LOCK ON HARD ERROR
```

```
3211                                    ; ***************************************************************************
3212                                            .SBTTL BT012 "MOV  #N,R" TEST WITH N=177777,[R]=000000
3213                                    ; ***************************************************************************
3214
3215                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3216
3217                                    ;ROM SEQ:       [172,257,200,125,375,016] FC 1,4,8
3218
3219                                    ;ACT BUTS:      37[004]100,172 / 22[172]200,200 / 16[125]016,016
3220
3221                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=177777
3222
3223                                    ;CODES:         [125]SPS=3      /       N:C=1000
3224
3225                                    ;SYNC:          B05J2   (-)     T= 2.3 USEC
3226
3227                                    ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=0 L
3228
3229  001152  005000                    BT012:  CLR     R0              ;MAKE [R0] = 000000
3230  001154  000257                            CCC                     ;MAKE N:C=0000
3231
3232  001156  012700  177777            I012:   MOV     #-1,R0          ;TEST THE MOV - [R0] S/B = 177777
3233
3234  001162  005100                            COM     R0              ;MAKE [R0] = 000000
3235  001164  001402                            BEQ     BT013           ;BR IF "Z" SET
3236
3237  001166  000000                    E012:   HALT                    ;ERROR - MOV FAILED TO LOAD R0 WITH ALL 1'S
3238  001170  000770                            BR      BT012           ;LOCK ON HARD ERROR
3239
```

```
3240                            ; ***************************************************************************
3241                                    .SBTTL BT013 "MOV  #N,R" TEST WITH N=000000,[R]=177777
3242                            ; ***************************************************************************
3243
3244                            ;MICROPROGRAMMING / LOGIC INFORMATION
3245
3246                            ;ROM SEQ:       [142,240,250,160,204,000] FC 1,4,8
3247
3248                            ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,000
3249
3250                            ;EXEC:          [160]ALUC=LLLLL :[204]D=000000
3251
3252                            ;CODES:         [204]SPS=3      /       N:C=0100
3253
3254                            ;SYNC:          B05J2   (-)     T=2.3 USEC
3255
3256                            ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=0 L
3257
3258  001172  005000            BT013:  CLR     R0              ;MAKE [R0] = 000000
3259  001174  005100                    COM     R0              ;MAKE [R0] = 177777
3260  001176  000257                    CCC                     ;SCOPE SYNC
3261
3262  001200  012700  000000    I013:   MOV     #0,R0           ;TEST THE MOV - [R0] S/B = 000000
3263
3264  001204  005100                    COM     R0              ;MAKE [R0] = 177777, SET "C"
3265  001206  005500                    ADC     R0              ;MAKE [R0] = 000000
3266  001210  001402                    BEQ     BT014           ;BR IF "Z" GOT SET
3267
3268  001212  000000            E013:   HALT                    ;ERROR - MOV FAILED TO CLEAR R0
3269  001214  000766                    BR      BT013           ;LOCK ON HARD ERROR
3270
3271
```

```
                                ; ************************************************************************
                                        .SBTTL BT014 "CLR  (R)" TEST - [R] = 177776
                                ; ************************************************************************
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
                                ;EXEC:          [220]ALUC=HLLHH :[211]D=000000
                                ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=0000
                                ;SYNC:          B05J2   (-)     T=2.6 USEC
                                ;KEY SIG:       K3-4 CLR L / K3-3 DM=1 L
001216  012706  001000        BT014:  MOV     #STACKL,SP      ;SET UP STACK POINTER
001222  012700  177776                MOV     #PSW,R0         ;R0 POINTS TO PSW
001226  000277                        SCC                     ;MAKE [PSW] = 017
001230  005010                I014:   CLR     (R0)            ;TEST THE CLR - IT SHOULD CLEAR PSW
001232  001002                        BNE     BT015           ;BR IF CLR MADE "Z" = 0 - IT SHOULD
001234  000000                E014:   HALT                    ;ERROR- CLR FAILED TO CLEAR PSW
001236  000767                        BR      BT014           ;LOCK ON HARD ERROR
```

```
3301                                    ; ***************************************************************************
3302                                          .SBTTL BTO15 "CLR  (R)+" TEST - [R] = 177776
3303                                    ; ***************************************************************************
3304
3305                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3306
3307                                    ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8
3308
3309                                    ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016
3310
3311                                    ;EXEC:          [220]ALUC=HLLHH :[211]D=000000
3312
3313                                    ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=0000
3314
3315                                    ;SYNC:          B05J2   (-)     T=2.6 USEC
3316
3317                                    ;KEY SIG:       K3-4 CLR L / K3-3 DM=2 L / K5-5 BCON (1+2) H
3318
3319  001240  012700  177776      BTO15:  MOV     #PSW,R0         ;R0 POINTS TO PSW
3320  001244  000277                  SCC                     ;MAKE [PSW] = 017
3321
3322  001246  005020              IO15:   CLR     (R0)+           ;TEST THE CLR - IT SHOULD CLEAR PSW
3323
3324  001250  001002                  BNE     A015            ;BR IF CLR MADE "Z" = 0 - IT SHOULD
3325
3326  001252  000000              E1015A: HALT                    ;ERROR- CLR FAILED TO CLEAR PSW
3327  001254  000771                  BR      BTO15           ;LOCK ON HARD ERROR
3328
3329  001256  005700              A015:   TST     R0              ;AUTO INC SHOULD ZERO R0
3330
3331  001260  001402                  BEQ     BTO16           ;BR IF IT DID
3332
3333  001262  000000              E2015:  HALT                    ;ERROR - AUTOINC. FAILED
3334  001264  000765                  BR      BTO15           :LOCK ON HARD ERROR
3335
3336
```

```
3337                                    ; ******************************************************************************
3338                                    .SBTTL BT016 "COM  (R)" TEST - [R] = 177776
3339                                    ; ******************************************************************************
3340
3341                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3342
3343                                    ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
3344
3345                                    ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
3346
3347                                    ;EXEC:          [220]ALUC=HLLLL :[211]D=000357
3348
3349                                    ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=1111
3350
3351                                    ;SYNC:          B05J2   (-)     T=1.8 USEC
3352
3353                                    ;KEY SIG:       K3-4 COM L / K3-3 DM=1 L
3354
3355  001266  012700  177776      BT016:  MOV     #PSW,R0         ;R0 POINTS TO PSW
3356  001272  000257                  CCC                     ;MAKE [PSW] = 000
3357
3358  001274  005110              I016:   COM     (R0)            ;TEST THE COM - [PSW] S/B = 357
3359
3360  001276  100003                  BPL     E016            ;N:C=1111 ?
3361  001300  001002                  BNE     E016
3362  001302  102001                  BVC     E016
3363  001304  103402                  BCS     BT017
3364
3365  001306  000000              E016:   HALT                    ;ERROR - COM FAILED TO MAKE [PSW] = 357
3366  001310  000766                  BR      BT016           ;LOCK ON HARD ERROR
3367
```

```
                                ; ***************************************************************************
                                ;       .SBTTL BTO17 "COM  (RO)+" TEST - [RO] = 177776
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [162,160,267,220,211,367,375,016] FC 1,3,9,8
                                ;
                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016
                                ;
                                ;EXEC:          [220]ALUC=HLLLL :[211]D=000357
                                ;
                                ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=1111
                                ;
                                ;SYNC:          B05J2   (-)     T=2 USEC
                                ;
                                ;KEY SIG:       K3-4 COM L / K3-3 DM=2 L / K5-5 BCON(1+2) H
                                ;
001312  012700  177776        BTO17:  MOV     #PSW,RO         ;RO POINTS TO PSW
001316  005010                        CLR     (RO)            ;MAKE [PSW] = 000
001320  000257                        CCC                     ;SCOPE SYNC
                                ;
001322  005120                IO17:   COM     (RO)+           ;TEST THE COM - [PSW] S/B = 357
                                ;
001324  100003                        BPL     E1017           ;N:C = 1111 ?
001326  001002                        BNE     E1017
001330  102001                        BVC     E1017
001332  103402                        BCS     A017
                                ;
001334  000000                E1017:  HALT                    ;COM FAILED TO SET ALL FLAGS
001336  000765                        BR      BTO17           ;LOCK ON HARD ERROR
                                ;
001340  005100                A017:   COM     RO              ;SHOULD MAKE [RO] = 177777
001342  005500                        ACC     RO              ;SHOULD MAKE [RO] = 000000
001344  001402                        BEQ     BTO20
                                ;
001346  000000                E2017:  HALT                    ;ERROR - COM FAILED TO AUTO INC. RO
001350  000760                        BR      BTO17           ;LOCK ON HARD ERROR
                                ;
```

```
3407                                ; ***************************************************************************
3408                                        .SBTTL BT020 "MOV  RA,RB" TEST - WITH [RA]=177777,[RB]=000000
3409                                ; ***************************************************************************
3410
3411                                ;MICROPROGRAMMING / LOGIC INFORMATION
3412
3413                                ;ROM SEQ:       [170,204,001] FC 1,4,8
3414
3415                                ;ACT BUTS:      37[004]100,170 / 20[170]000,001
3416
3417                                ;EXEC:          [170]ALUC=LLLLL :[204]D=177777
3418
3419                                ;CODES:         [204]SPS=3      /       N:C=1000
3420
3421                                ;SYNC:          B05J2   (-)     T=1 USEC
3422
3423                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3424
3425  001352  005000                BT020:  CLR     R0              ;MAKE [R0]=000000
3426  001354  005001                        CLR     R1              ;MAKE [R1]=000000
3427  001356  005101                        COM     R1              ;MAKE [R1]=0207777
3428  001360  000257                        CCC                     ;SCOPE SYNC
3429
3430  001362  010100                I020:   MOV     R1,R0           ;TEST THE MOV
3431
3432  001364  100402                        BMI     A020            ;BR IF "N" GOT SET
3433
3434  001366  000000                E1020:  HALT                    ;ERROR-MOV FAILED TO SET "N"
3435  001370  000770                        BR      BT020           ;LOCK ON HARD ERROR
3436
3437  001372  005100                A020:   COM     R0              ;[R0] SHOULD GO TO 000000
3438  001374  001402                        BEQ     BT021           ;BR IF IT DID
3439
3440  001376  000000                E2020:  HALT                    ;ERROR-MOV FAILED TO LOAD R0 WITH 1'S
3441  001400  000764                        BR      BT020           ;LOCK ON HARD ERROR
3442
```

```
3443                                    ; ***************************************************************************
3444                                            .SBTTL BT021 "MOV  RA,RB" TEST WITH [RA]=000000,[RB]=177777
3445                                    ; ***************************************************************************
3446
3447                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3448
3449                                    ;ROM SEQ:       [170,204,001] FC 1,4,8
3450
3451                                    ;ACT BUTS:      37[004]100,170 / 20[170]000,001
3452
3453                                    ;EXEC:          [170]ALUC=LLLLL :[204]D=000000
3454
3455                                    ;CODES:         [204]SPS=3      /       N:C=0100
3456
3457                                    ;SYNC:          B05J2   (-)     T=1 USEC
3458
3459                                    ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3460
3461  001402  005000                    BT021:  CLR     R0              ;MAKE [R0]=000000
3462  001404  005100                            COM     R0              ;MAKE [R0]=177777
3463  001406  005001                            CLR     R1              ;MAKE [R1]=000000
3464  001410  000257                            CCC                     ;SCOPE SYNC
3465
3466  001412  010100                    I021:   MOV     R1,R0           ;TEST THE MOV
3467
3468  001414  001402                            BEQ     A021            ;BR IF "Z" GOT SET
3469
3470  001416  000000                    E1021:  HALT                    ;MOV FAILED TO SET "Z"
3471  001420  000770                            BR      BT021           ;LOCK ON HARD ERROR
3472
3473  001422  005100                    A021:   COM     R0              ;SHOULD MAKE [R0]=177777 AND SET "C"
3474  001424  005500                            ADC     R0              ;SHOULD MAKE [R0]=000000
3475  001426  001402                            BEQ     BT022           ;BR IF "Z" SET
3476
3477  001430  000000                    E2021:  HALT                    ;MOV FAILED TO ZERO R0
3478  001432  000763                            BR      BT021           ;LOCK ON HARD ERROR
3479
```

```
3480                                    ; ***************************************************************************
3481                                            .SBTTL BT022 "MOV  #N,@#A" TEST WITH N=17,A=177776
3482                                    ; ***************************************************************************
3483
3484                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3485
3486                                    ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8
3487
3488                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016
3489
3490                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=000017
3491
3492                                    ;CODES:         [125]SPS=3      /       N:C=1111
3493
3494                                    ;SYNC:          B05J2   (-)     T=4 USEC
3495
3496                                    ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=3 L / K5-5 BC01 H
3497                                                    ; K5-5 BCON(1+2) H
3498
3499  001434  000257                    BT022:  CCC                             ;MAKE [PSW]=000
3500
3501  001436  012737  000017  177776    I022:   MOV     #17,@#PSW               ;TEST THE MOV
3502
3503  001444  100003                            BPL     E022                    ;N:C=1111
3504  001446  001002                            BNE     E022
3505  001450  102001                            BVC     E022
3506  001452  103402                            BCS     BT023
3507
3508  001454  000000                    E022:   HALT                            ;MOV FAILED TO LOAD PSW
3509  001456  000766                            BR      BT022                   ;LOCK ON HARD ERROR
3510
```

```
                                ; ************************************************************************
                                ;       .SBTTL BT023 "MOV  RA,(RB)+" TEST WITH [RA]=17,[RB]=177776
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [172,257,201,125,375,016] FC 1,4,8
                                ;
                                ;ACT BUTS:      37[004]100,172 / 22[172]200,201 / 16[125]016,016
                                ;
                                ;EXEC:          [201]ALUC=LLLLL :[125]D=000017
                                ;
                                ;CODES:         [125]SPS=3      /       N:C=1111
                                ;
                                ;SYNC:          B05J2   (-)     T=2.42 USEC
                                ;
                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=2 L / K5-5 BCON(1+2) H
                                ;
001460  012700  177776          BT023:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001464  012701  000017                  MOV     #17,R1          ;[SOURCE]=017
001470  005010                          CLR     (R0)            ;MAKE [PSW]=000
001472  000257                          CCC                     ;SCOPE SYNC
                                ;
001474  010120                  I023:   MOV     R1,(R0)+        ;TEST THE MOV
                                ;
001476  100003                          BPL     E1023           ;N:C = 1111 ?
001500  001002                          BNE     E1023
001502  102001                          BVC     E1023
001504  103402                          BCS     A023
                                ;
001506  000000                  E1023:  HALT                    ;MOV FAILED TO LOAD PSW
001510  000763                          BR      BT023           ;LOCK ON HARD ERROR
                                ;
001512  005100                  A023:   COM     R0              ;SHOULD MAKE [R0]=177777
001514  005500                          ADC     R0              ;SHOULD MAKE [R0]=000000
001516  001402                          BEQ     BT024           ;BR IF IT DID
                                ;
001520  000000                  E0232:  HALT                    ;MOV FAILED TO AUTO INC. R0
001522  000756                          BR      BT023           ;LOCK ON HARD ERROR
                                ;
```

```
3551                                    ; ************************************************************************
3552                                            .SBTTL BT024 "CMP  #N,@#A" TEST WITH N=(A)
3553                                    ; ************************************************************************
3554
3555                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3556
3557                                    ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
3558
3559                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
3560
3561                                    ;EXEC:          [225]ALUC=LLHHL :[367]D=000000
3562
3563                                    ;CODES:         [367]SPS=3      /       N:C=0100
3564
3565                                    ;SYNC:          B05J2   (-)     T=5.2 USEC
3566
3567                                    ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CIN00 L
3568                                                    ; K4-4 ALLOW CLK L / K5-5 BC01 H
3569
3570  001524  012700  177776           BT024:  MOV     #PSW,R0         ;R0 POINTS TO PSW
3571  001530  005010                          CLR     (R0)            ;MAKE [PSW]=000
3572  001532  000273                          273                     ;MAKE N:C=1011
3573
3574  001534  022737  000013  177776   I024:   CMP     #13,@#PSW       ;TEST THE CMP
3575
3576  001542  001402                          BEQ     BT025           ;BR IF "Z" GOT SET
3577
3578  001544  000000                  E024:   HALT                    ;CMP FAILED TO SET "Z"
3579  001546  000766                          BR      BT024           ;LOCK ON HARD ERROR
3580
3581
```

```
                                ; ************************************************************************
                                        .SBTTL BT025 "CMP  #N,@#A" WITH N > (A)
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LLHHL :[367]D=177761

                                ;CODES:         [367]SPS=3      /       N:C=1001

                                ;SYNC:          B05J2   (-)     T=5.2 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CIN00 L
                                                ; K4-4 ALLOW CLK L / K5-5 BC01 H

001550  000257                 BT025:  CCC                     ;MAKE [PSW]=000

001552  022737  000017  177776 I025:   CMP     #17,@#PSW      ;TEST THE CMP

001560  001401                         BEQ     E025           ;BR IF "Z" GOT SET
001562  000402                         BR      BT026          ;GO TO NEXT TEST

001564  000000                 E025:   HALT                    ;CMP FAILED TO CLEAR "Z"
001566  000770                         BR      BT025          ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT026 "CMP  #N,@#A" WITH N <  (A)
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
                                ;
                                ;EXEC:          [225]ALUC=LLHHL :[367]D=177761
                                ;
                                ;CODES:         [367]SPS=3      /       N:C=1001
                                ;
                                ;SYNC:          BO5J2   (-)     T=5.2 USEC
                                ;
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CINOO L
                                ; K4-4 ALLOW CLK L / K5-5 BCO1 H
                                ;
001570  000277                 BT026:  SCC                     ;MAKE [PSW]=017
                                ;
001572  022737  000000  177776  I026:   CMP     #0,@#PSW        ;TEST THE CMP
                                ;
001600  001401                         BEQ     E026            ;BR IF "Z" GOT SET
001602  000402                         BR      BT027           ;GO TO NEXT TEST
                                ;
001604  000000                 E026:   HALT                    ;CMP FAILED TO CLEAR "Z"
001606  000770                         BR      BT026           ;LOCK ON HARD ERROR
                                ;
```

```
3639                                    ; ************************************************************************
3640                                          .SBTTL BT027 "CMP  R,#N" TEST WITH [R]=N
3641                                    ; ************************************************************************
3642
3643                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3644
3645                                    ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8
3646
3647                                    ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016
3648
3649                                    ;EXEC:          [224]ALUC=LLHHL :[367]D=000000
3650
3651                                    ;CODES:         [367]SPS=3      /       N:C=0100
3652
3653                                    ;SYNC:          B05J2   (-)     T=2.6 USEC
3654
3655                                    ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
3656                                                    ; K4-4 ALLOW CLK L
3657
3658  001610  012700  177777           BT027:  MOV     #-1,R0          ;MAKE [R0]=177777
3659  001614  000257                          CCC                     ;N:C=0000
3660
3661  001616  020027  177777           I027:   CMP     R0,#-1          ;TEST THE CMP
3662
3663  001622  001402                          BEQ     BT030           ;BR IF CMP SET "Z"
3664
3665  001624  000000                   E027:   HALT                    ;CMP FAILED
3666  001626  000770                          BR      BT027           ;LOCK ON HARD ERROR
3667
```

```
                                ; ***************************************************************************
                                ;       .SBTTL BT030 "CMP  R,#N" TEST WITH [R] > N
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8
                                ;
                                ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016
                                ;
                                ;EXEC:          [224]ALUC=LLHHL :[367]D=000002
                                ;
                                ;CODES:         [367]SPS=3      /       N:C=0001
                                ;
                                ;SYNC:          B05J2   (-)     T=2.6 USEC
                                ;
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
                                ; K4-4 ALLOW CLK L
                                ;
001630  012700  000001         BT030:  MOV     #1,R0           ;MAKE [R0]=000001
001634  000264                         SEZ                     ;SET THE "Z" BIT
                                ;
001636  020027  177777         I030:   CMP     R0,#-1          ;TEST THE CMP
                                ;
001642  001002                         BNE     BT031           ;BR IF CMP CLEARED "Z"
                                ;
001644  000000                 E030:   HALT                    ;CMP FAILED
001646  000770                         BR      BT030           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL BT031 "CMP  R,#N" TEST WITH [R] < N
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8
                                ;
                                ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016
                                ;
                                ;EXEC:          [224]ALUC=LLHHL :[367]D=177762
                                ;
                                ;CODES:         [367]SPS=3      /       N:C=1001
                                ;
                                ;SYNC:          B05J2   (-)     T=2.6 USEC
                                ;
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
                                ; K4-4 ALLOW CLK L
                                ;
001650  012700  000001          BT031:  MOV     #1,R0           ;MAKE [R0] = 000001
001654  000264                         SEZ                     ;SET THE "Z" BIT
                                ;
001656  020027  000017          I031:   CMP     R0,#17          ;TEST THE CMP
                                ;
001662  001002                          BNE     BT032           ;BR IF CMP CLEARED "Z"
                                ;
001664  000000                 E031:   HALT                    ;CMP FAILED TO SET "Z"
001666  000770                         BR      BT031           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL BT032 "CMP  (RA)+,RB" TEST WITH [SOURCE]=[RB]
                                ; ************************************************************************
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016
                                ;EXEC:          [371]ALUC=LLHHL :[362]D=000000
                                ;CODES:         [362]SPS=3      /       N:C=0100
                                ;SYNC:          B05J2   (-)     T=2.5 USEC
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                ; K3-8 CINOO L

001670  012700  177776        BT032:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001674  012737  000340  177776        MOV     #340,@#PSW      ;MAKE [PSW]=340
001702  012701  000340                MOV     #340,R1         ;MAKE [DEST]=340
001706  000257                      CCC                     ;N:C=0000

001710  022001                I032:   CMP     (R0)+,R1        ;TEST THE CMP

001712  001402                        BEQ     A032            ;BR IF "Z" GOT SET

001714  000000                E1032:  HALT                    ;CMP FAILED TO ACCESS PSW
001716  000764                        BR      BT032           ;LOCK ON HARD ERROR

001720  005100                A032:   COM     R0              ;MAKE [R0]=177777
001722  005500                        ADC     R0              ;MAKE [R0]=000000
001724  001402                        BEQ     BT033           ;BR IF "Z" SET

001726  000000                E2032:  HALT                    ;CMP FAILED TO AUTO INC. R0
001730  000757                        BR      BT032           ;LOCK ON HARD ERROR
```

```
                                ; ******************************************************************************
                                ;       .SBTTL BT033 "CMP  (RA)+,RB" TEST WITH [SOURCE]>[RB]
                                ; ******************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016
                                ;
                                ;EXEC:          [371]ALUC=LLHHL :[362]D=000010
                                ;
                                ;CODES:         [362]SPS=3      /       N:C=0000
                                ;
                                ;SYNC:          B05J2   (-)     T=2.5 USEC
                                ;
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                ; K3-8 CINOO L
                                ;
001732  012700  177776  BT033:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001736  012737  000340  177776  MOV     #340,@#PSW      ;MAKE [PSW]=340
001744  012701  000330          MOV     #330,R1         ;MAKE [DEST]=330
001750  000264                  SEZ                     ;SET THE "Z" BIT
                                ;
001752  022001          I033:   CMP     (R0)+,R1        ;TEST THE CMP
                                ;
001754  001002                  BNE     A033            ;BR IF "Z" GOT CLEARED
                                ;
001756  000000          E1033:  HALT                    ;CMP FAILED TO ACCESS PSW
001760  000764                  BR      BT033           ;LOCK ON HARD ERROR
                                ;
001762  005100          A033:   COM     R0              ;MAKE [R0]=177777
001764  005500                  ADC     R0              ;MAKE [R0]=000000
001766  001402                  BEQ     BT034           ;BR IF "Z" SET
                                ;
001770  000000          E2033:  HALT                    ;CMP FAILED TO AUTO INC. R0
001772  000757                  BR      BT033           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL BT034 "CMP  (RA)+,RB" TEST WITH [SOURCE]<[RB]
                                ; ************************************************************************
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016
                                ;EXEC:          [371]ALUC=LLHHL :[362]D=177770
                                ;CODES:         [362]SPS=3      /       N:C=1001
                                ;SYNC:          B05J2   (-)     T=2.5 USEC
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                ;               ; K3-8 CINOO L
001774  012700  177776        BT034:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002000  012737  000330  177776        MOV     #330,@#PSW      ;MAKE [PSW]=330
002006  012701  000340                MOV     #340,R1         ;MAKE [DEST]=340
002012  000264                       SEZ                     ;SET THE "Z" BIT

002014  022001                I034:   CMP     (R0)+,R1        ;TEST THE CMP

002016  001002                        BNE     A034            ;BR IF "Z" GOT CLEARED

002020  000000                E1034:  HALT                    ;CMP FAILED TO ACCESS PSW
002022  000764                        BR      BT034           ;LOCK ON HARD ERROR

002024  005100                A034:   COM     R0              ;MAKE [R0]=177777
002026  005500                        ADC     R0              ;MAKE [R0]=000000
002030  001402                        BEQ     BT035           ;BR IF "Z" SET

002032  000000                E2034:  HALT                    ;CMP FAILED TO AUTO INC. R0
002034  000757                        BR      BT034           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL BT035 "CMP  RA,RB" TEST WITH [RA] = [RB]
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [102,364,362,001] FC 1,8
                                ;
                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
                                ;
                                ;EXEC:          [364]ALUC=LLHHL :[362]D=000000
                                ;
                                ;CODES:         [362]SPS=3      /       N:C=0100
                                ;
                                ;SYNC:          B05J2   (-)     T=1 USEC
                                ;
                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
                                ; K3-8 CIN00 L
                                ;
002036  012700  125252  BT035:  MOV     #125252,R0      ;MAKE [R0] = 125252
002042  010001          MOV     R0,R1           ;MAKE [R1] = 125252
002044  000257          CCC                     ;SCOPE SYNC
                                ;
002046  020100  I035:   CMP     R1,R0           ;TEST THE CMP
                                ;
002050  001402          BEQ     BT036           ;BR IF "Z" GOT SET
                                ;
002052  000000  E035:   HALT                    ;ERROR - CMP FAILED TO SET "Z"
002054  000770          BR      BT035           ;LOCK ON HARD ERROR
```

```
3867                                    ; ******************************************************************************
3868                                            .SBTTL BT036 "CMP  RA,RB" TEST WITH [RA] < [RB]
3869                                    ; ******************************************************************************
3870
3871                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3872
3873                                    ;ROM SEQ:       [102,364,362,001] FC 1,8
3874
3875                                    ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
3876
3877                                    ;EXEC:          [364]ALUC=LLHHL :[362]D=152526
3878
3879                                    ;CODES:         [362]SPS=3      /       N:C=1001
3880
3881                                    ;SYNC:          B05J2   (-)     T=1 USEC
3882
3883                                    ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3884                                                    ; K3-8 CIN00 L
3885
3886  002056  012700  025252       BT036:  MOV     #25252,R0       ;MAKE [R0] = 25252
3887  002062  005001                  CLR     R1              ;MAKE [R1] = 000000
3888  002064  000264                  SEZ                     ;SCOPE SYNC - SET "Z"
3889
3890  002066  020100               I036:   CMP     R1,R0           ;TEST THE CMP
3891
3892  002070  001002                  BNE     BT037           ;BR IF "Z" GOT  CLEARED
3893
3894  002072  000000               E036:   HALT                    ;ERROR - CMP FAILED TO SET "Z"
3895  002074  000770                  BR      BT036           ;LOCK ON HARD ERROR
```

```
3896                                    ; ***************************************************************************
3897                                            .SBTTL BT037 "CMP  RA,RB" TEST WITH [RA] > [RB]
3898                                    ; ***************************************************************************
3899
3900                                    ;MICROPROGRAMMING / LOGIC INFORMATION
3901
3902                                    ;ROM SEQ:       [102,364,362,001] FC 1,8
3903
3904                                    ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
3905
3906                                    ;EXEC:          [364]ALUC=LLHHL :[362]D=000017
3907
3908                                    ;CODES:         [362]SPS=3      /       N:C=0000
3909
3910                                    ;SYNC:          B05J2   (-)     T=1 USEC
3911
3912                                    ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
3913                                                    ; K3-8 CIN00 L
3914
3915  002076  005000                    BT037:  CLR     R0              ;MAKE [R0] = 000000
3916  002100  012701  000017                   MOV     #17,R1          ;MAKE [R1] = 000017
3917  002104  000264                           SEZ                     ;SCOPE SYNC - SET "Z"
3918
3919  002106  020100                    I037:   CMP     R1,R0           ;TEST THE CMP
3920
3921  002110  001002                           BNE     BT040           ;BR IF "Z" GOT CLEARED
3922
3923  002112  000000                    E037:   HALT                    ;ERROR - CMP FAILED TO SET "Z"
3924  002114  000770                           BR      BT037           ;LOCK ON HARD ERROR
3925
```

```
                                ; ************************************************************************
                                        .SBTTL BT040 "MOV  (RA),RB" TEST WITH [SOURCE]=[RB]=17
                                ; ************************************************************************
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8
                                ;ACT BUTS:      37[004]100,141 / 35[247]120,160 / 20[160]000,000
                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000017
                                ;CODES:         [204]SPS=3      /       N:C=0001
                                ;SYNC:          B05J2   (-)     T=2.3 USEC
                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=1 L / K3-3 DM=0 L

002116  012700  177776      BT040:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002122  005010                      CLR     (R0)            ;MAKE [PSW]=000
002124  005001                      CLR     R1              ;MAKE [R1]=000000
002126  000277                      SCC                     ;MAKE N:C=1111

002130  011001              I040:   MOV     (R0),R1         ;TEST THE MOV

002132  020127  000017              CMP     R1,#17          ;DID R1 GET LOADED WITH 000017 ?
002136  001402                      BEQ     BT041           ;BR IF YES

002140  000000              E040:   HALT                    ;MOV FAILED TO LOAD R1
002142  000765                      BR      BT040           ;LOCK ON HARD ERROR
```

```
                        ; ************************************************************************
                        ;       .SBTTL BT041 "MOV  (RA)+,RB" TEST WITH [SOURCE]=[RB]=17
                        ; ************************************************************************

                        ;MICROPROGRAMMING / LOGIC INFORMATION

                        ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8

                        ;ACT BUTS:      37[004]100,141 / 35[247]120,160 / 20[160]000,000

                        ;EXEC:          [160]ALUC=LLLLL :[204]D=000017

                        ;CODES:         [204]SPS=3      /       N:C=0001

                        ;SYNC:          BOSJ2   (-)     T=2.3 USEC

                        ;KEY SIG:       K3-3 MOV L / K3-3 SM=1 L / K3-3 DM=0 L

002144  012700  177776  BT041:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002150  005010                  CLR     (R0)            ;MAKE [PSW]=000
002152  005001                  CLR     R1              ;MAKE [R1]=000000
002154  000277                  SCC                     ;MAKE N:C=1111

002156  012001          I041:   MOV     (R0)+,R1                ;TEST THE MOV

002160  020127  000017          CMP     R1,#17          ;DID R1 GET LOADED WITH 000017 ?
002164  001402                  BEQ     A041            ;BR IF YES

002166  000000          E1041:  HALT                    ;MOV FAILED TO LOAD R1
002170  000765                  BR      BT041           ;LOCK ON HARD ERROR

002172  005100          A041:   COM     R0              ;[R0] SHOULD GO TO 177777
002174  005500                  ADC     R0              ;[R0] SHOULD GO TO 000000
002176  001402                  BEQ     BT042           ;BR IF "Z" GOT SET

002200  000000          E2041:  HALT                    ;MOV FAILED TO AUTO INC. R0
002202  000760                  BR      BT041           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT042 "XOR  RA,RB" TEST WITH [RA] = [RB] = 000000
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                ;CODES:         [360]SPS=3      /       N:C=0100

                                ;SYNC:          BOSJ2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H


002204  005000          BT042:  CLR     R0              ;MAKE [R0] = 000000
002206  005001                  CLR     R1              ;MAKE [R1] = 000000
002210  000257                  CCC                     ;SCOPE SYNC

002212  074100          I042:   XOR     R1,R0           ;TEST THE XOR

002214  005700                  TST     R0              ;RESULT = 000000 ?
002216  001402                  BEQ     BT043           ;BR IF YES

002220  000000          E042:   HALT                    ;XOR FAILED
002222  000770                  BR      BT042
```

```
                                ; ************************************************************************
                                        .SBTTL BT043 "XOR  RA,RB" TEST WITH [RA] = [RB] = 177777
                                ; ************************************************************************
                                ;MICROPROGRAMMING / LOGIC INFORMATION
                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8
                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
                                ;EXEC:          [364]ALUC=HLHHL :[360]D=000000
                                ;CODES:         [360]SPS=3      /       N:C=0100
                                ;SYNC:          B05J2   (-)     T=1 USEC
                                ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H
002224  005000        BT043:  CLR     R0              ;MAKE [R0] = 177777
002226  005100                COM     R0
002230  010001                MOV     R0,R1           ;MAKE [R1] = 177777
002232  000257                CCC                     ;SCOPE SYNC

002234  074100        I043:   XOR     R1,R0           ;TEST THE XOR

002236  005700                TST     R0              ;RESULT = 000000 ?
002240  001402                BEQ     BT044   ;BR IF YES

002242  000000        E043:   HALT                    ;XOR FAILED
002244  000767                BR      BT043           ;LOCK ON HARD ERROR
```

```
4056                                    ; ************************************************************************
4057                                            .SBTTL BT044 "XOR  RA,RB" TEST WITH [RB]=052525,[RA]=125252
4058                                    ; ************************************************************************
4059
4060                                    ;MICROPROGRAMMING / LOGIC INFORMATION
4061
4062                                    ;ROM SEQ:       [102,364,360,001] FC 1,7,8
4063
4064                                    ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
4065
4066                                    ;EXEC:          [364]ALUC=HLHHL :[360]D=177777
4067
4068                                    ;CODES:         [360]SPS=3      /       N:C=1000
4069
4070                                    ;SYNC:          B05J2   (-)     T=1 USEC
4071
4072                                    ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H
4073
4074  002246  012701  125252      BT044:  MOV     #125252,R1      ;MAKE [R1]=125252
4075  002252  012700  052525              MOV     #052525,R0      ;MAKE [R0]=052525
4076  002256  000257                      CCC                     ;SCOPE SYNC
4077
4078  002260  074100              IO44:   XOR     R1,R0           ;TEST THE XOR
4079
4080  002262  020027  177777              CMP     R0,#-1          ;RESULT = 177777 ?
4081  002266  001402                      BEQ     BT045           ;BR IF YES
4082
4083  002270  000000              EO44:   HALT                    ;XOR FAILED
4084  002272  000400                      BR      BT045           ;LOCK ON HARD ERROR
```

```
4085                                    ; ***************************************************************************
4086                                    .SBTTL BT045 "XOR  RA,RB" TEST WITH [RA]=052525,[RB]=125252
4087                                    ; ***************************************************************************
4088
4089                                    ;MICROPROGRAMMING / LOGIC INFORMATION
4090
4091                                    ;ROM SEQ:       [102,364,360,001] FC 1,7,8
4092
4093                                    ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
4094
4095                                    ;EXEC:          [364]ALUC=HLHHL :[360]D=177777
4096
4097                                    ;CODES:         [360]SPS=3      /       N:C=1000
4098
4099                                    ;SYNC:          B05J2   (-)     T=1 USEC
4100
4101                                    ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H
4102
4103  002274  012700  125252            BT045:  MOV     #125252,R0      ;MAKE [R0]=125252
4104  002300  012701  052525                    MOV     #052525,R1      ;MAKE [R1]=052525
4105  002304  000257                              CCC                     ;SCOPE SYNC
4106
4107  002306  074100                    I045:   XOR     R1,R0           ;TEST THE XOR
4108
4109  002310  020027  177777                    CMP     R0,#-1          ;RESULT = 177777 ?
4110  002314  001402                              BEQ     BT046           ;BR IF YES
4111
4112  002316  000000                    E045:   HALT                    ;XOR FAILED
4113  002320  000765                              BR      BT045           ;LOCK ON HARD ERROR
4114
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL BT046 GPR ADDRESS INTERRACTION TEST
                                        ; ***************************************************************************

002322  012700  125252          BT046:  MOV     #125252,R0      ;[R0] = 125252
002326  010001                          MOV     R0,R1
002330  005101                          COM     R1              ;[R1] = 052525
002332  010102                          MOV     R1,R2
002334  005102                          COM     R2              ;[R2] = 125252
002336  010203                          MOV     R2,R3
002340  005103                          COM     R3              ;[R3] = 052525
002342  010304                          MOV     R3,R4
002344  005104                          COM     R4              ;[R4] = 125252
002346  010405                          MOV     R4,R5
002350  005105                          COM     R5              ;[R5] = 052525

002352  074100                  I046:   XOR     R1,R0           ;[R0] S/B = 177777
002354  074200                          XOR     R2,R0           ;[R0] S/B = 125252
002356  074300                          XOR     R3,R0           ;[R0] S/B = 177777
002360  074400                          XOR     R4,R0           ;[R0]  S/B = 125252
002362  074500                          XOR     R5,R0           ;[R0]  S/B = 177777
002364  005100                          COM     R0              ;[R0] S/B = 000000

002366  001402                          BEQ     A046            ;BR IF [R0] WAS 000000

002370  000000                  E1046:  HALT                    ;GPR ADDRESSING PROBLEM
002372  000753                          BR      BT046           ;LOCK ON HARD ERROR

002374  020627  001000          A046:   CMP     SP,#STACKL      ;DID R6 GET DISTURBED
002400  001577                          BEQ     INIT            ;BR IF NOT

002402  000000                  E2046:  HALT                    ;R6 ADDRESS PROBLEM
002404  000746                          BR      BT046           ;LOCK ON HARD ERROR

        003000                  .=3000
```

```
4150                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
4151                                    ;       / / / / / / / BASIC INSTRUCTION TESTS / / / / / / /
4152                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
4153
4154  003000  012706  001000            INIT:   MOV     #BT001,SP       ;SET UP THE STACK POINTER
4155  003004  012737  000001  066662            MOV     #1,@#ICOUNT     ;NO ITERATIONS ON INITIAL PASS
4156  003012  012737  000001  066664            MOV     #1,@#ITCNT
4157  003020  012701  066666                    MOV     #ERRCNT,R1      ;SET UP TO INIT. COUNTERS AND FLAGS
4158  003024  005021                    1$:     CLR     (R1)+           ;CLEAR ONE WORD
4159  003026  020127  066724                    CMP     R1,#ONCE+2      ;CLEARED ALL FLAGS AND COUNTERS?
4160  003032  001374                            BNE     1$              ;BR IF NOT
4161  003034  012706  001000            BEGIN:  MOV     #BT001,SP       ;SET UP THE STACK POINTER
4162
4163                                    ; ***************************************************************
4164                                            .SBTTL T0001 BASIC "BNE" TEST WITH Z=0
4165                                    ; ***************************************************************
4166
4167                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4168
4169                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
4170
4171                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
4172
4173                                    ;EXEC:          [341]ALUC = LHLLH  :[016] D = #T0002
4174
4175                                    ;CODES:         N / A
4176
4177                                    ;SYNC:          B05J2  (-)      /       T= 1.8 USEC
4178
4179                                    ;KEY SIG:       K5-3 FALSE BR L  /  K5-3 BR INSTR L
4180
4181  003040  012700  000001            T0001:  MOV     #0001,R0                ;LOAD R0 WITH TEST NO.
4182  003044  000257                    R0001:  CCC                     ;MAKE Z=0
4183
4184  003046  001002                    I0001:  BNE     T0002           ;TEST THE BNE - IT SHOULD BR
4185
4186  003050  000000                    E0001:  HALT                    ;BNE FAILED TO LOAD PC
4187  003052  000774                            BR      R0001           ;LOCK ON HARD ERROR
4188
```

```
                                ; ************************************************************************
                                        .SBTTL T0002 BASIC "BNE" TEST WITH Z=1
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [110,347,016]FC 1,7
                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
                                ;EXEC:          NO-OP=[016] D= #I0002
                                ;CODES:         N / A
                                ;SYNC:          B05J2 (-)       /       T= 1.4 USEC
                                ;KEY SIG:       K5-3 BR INSTR L

003054  012700  000002          T0002:  MOV     #0002,R0                ;LOAD R0 WITH TEST NO.
003060  000264                  R0002:  SEZ                             ;SET THE "Z" BIT

003062  001001                  I0002:  BNE     E0002                   ;TEST THE BNE - IT SHOULD NOT BR

003064  000402                          BR      T0003                   ;GO TO NEXT TEST

003066  000000                  E0002:  HALT                            ;BNE BRANCHED WITH Z=1
003070  000773                          BR      R0002                   ;LOCK ON HARD ERROR
```

```
4217                                    ; ***************************************************************************
4218                                          .SBTTL T0003 BASIC "BEQ" TEST WITH Z=1
4219                                    ; ***************************************************************************
4220
4221                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4222
4223                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
4224
4225                                    ;ACT BUTS:      37[004]100,111 / 16[340]16,16
4226
4227                                    ;EXEC:          [341]ALUC=LHLLH :[016]D=#T0004
4228
4229                                    ;CODES:         N / A
4230
4231                                    ;SYNC:          B05J2 (-)       /       T= 1.8 USEC
4232
4233                                    ;KEY SIG:       K5-3 FALSE BRL  /  K5-3 BR INSTRL
4234
4235  003072  012700  000003            T0003:  MOV     #0003,R0                ;LOAD R0 WITH THE TEST NO.
4236  003076  000264                    R0003:  SEZ                             ;MAKE Z=1
4237
4238  003100  001402                    I0003:  BEQ     T0004                   ;TEST THE BEQ - IT SHOULD BR
4239
4240  003102  000000                    E0003:  HALT                            ;BEQ FAILED TO LOAD THE PC
4241  003104  000774                            BR      R0003                   ;LOCK ON HARD ERROR
```

```
4242                                    ; ***************************************************************************
4243                                    .SBTTL T0004 BASIC "BEQ" TEST WITH Z=0
4244                                    ; ***************************************************************************
4245
4246                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4247
4248                                    ;ROM SEQ:       [110,347,016] FC 1,7
4249
4250                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
4251
4252                                    ;EXEC:          NO-OP=[016] D= #I0004
4253
4254                                    ;CODES:         N / A
4255
4256                                    ;SYNC:          B05J2 (-)       /       T= 1.4 USEC
4257
4258                                    ;KEY SIG:       K5-3 BR INSTR L
4259
4260  003106  012700  000004           T0004:  MOV     #0004,R0        ;LOAD R0 WITH THE TEST NO.
4261  003112  000257                    R0004:  CCC                     ;MAKE Z=0
4262
4263  003114  001401                    I0004:  BEQ     E0004           ;TEST THE BEQ - IT SHOULD NOT BR
4264
4265  003116  000402                            BR      T0005           ;GO TO NEXT TEST
4266
4267  003120  000000                    E0004:  HALT                    ;BEQ BRANCHED WITH Z=0
4268  003122  000773                            BR      R0004           ;LOCK ON HARD ERROR
4269
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0005 BASIC "BPL" TEST WITH N=1
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:        [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:       37[004]100,110 / 16[110]16,16
                                ;
                                ;EXEC:           NO-OP=[016] D=#I0005
                                ;
                                ;CODES:          N / A
                                ;
                                ;SYNC:           B05J2 (-)       /       T= 1.4 USEC
                                ;
                                ;KEY SIG:        K5-3 BR INSTR L
                                ;
003124  012700  000005          T0005:  MOV     #0005,R0                ;LOAD R0 WITH TEST NO.
003130  005037  177776          R0005:  CLR     @#PSW           ;CLEAR THE PSW
003134  000270                          SEN                             ;MAKE N=1
                                ;
003136  100001                  I0005:  BPL     E0005           ;TEST THE BPL - IT SHOULDN'T BR
                                ;
003140  000402                          BR      T0006           ;GO TO NEXT TEST
                                ;
003142  000000                  E0005:  HALT                            ;BPL BRANCHED WITH N=1
003144  000771                          BR      R0005           ;LOCK ON HARD ERROR
                                ;
```

```
4299                                    ; ***************************************************************************
4300                                    .SBTTL T0006 BASIC "BPL" TEST WITH N=0
4301                                    ; ***************************************************************************
4302
4303                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4304
4305                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
4306
4307                                    ;ACT BUTS:      37[004]100,111 / 16[340]16,16
4308
4309                                    ;EXEC:          [341]ALUC LHLLH :[016]D=#T0007
4310
4311                                    ;CODES:         N / A
4312
4313                                    ;SYNC:          B05J2 (-)       /       T= 1.8 USEC
4314
4315                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L
4316
4317  003146  012700  000006           T0006:  MOV     #0006,R0        ;LOAD R0 WITH TEST NO.
4318  003152  005037  177776           R0006:  CLR     @#PSW           ;CLEAR THE PSW
4319  003156  000257                          CCC                     ;SCOPE SYNC
4320
4321  003160  100002                   I0006:  BPL     T0007           ;TEST THE BPL - IT SHOULD BR
4322
4323  003162  000000                   E0006:  HALT                    ;BPL FAILED TO LOAD THE PC
4324  003164  000772                           BR      R0006           ;LOCK ON HARD ERROR
4325
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0007 BASIC "MOV  (RA),RB" TEST - (RA)=177776
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8
                                ;ACT BUTS:      37[004]100,141  /  35[247]120,160  /  20[160]000,000
                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000017
                                ;CODES:         [204]SPS=3      /      N:C=0000
                                ;SYNC:          B05J2   (-)     T=2.25 USEC
                                ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=1 L  /  K3-3 DM=0 L

003166  012700  000007         T0007:  MOV     #0007,R0                ;LOAD R0 WITH TEST NO.
003172  012702  177703                 MOV     #177703,R2      ;DEST ADDR = R3
003176  012705  177776                 MOV     #PSW,R5         ;SOURCE ADDR = 177776
003202  012704  000017                 MOV     #17,R4          ;RESULT S / B=000017
003206  005015                 R0007:  CLR     (R5)            ;MAKE [PSW]=000
003210  005003                         CLR     R3              ;[DEST] = 000000
003212  000277                         SCC                     ;MAKE [PSW]=017

003214  011503                 I0007:  MOV     (R5),R3         ;TEST THE MOV

003216  020403                         CMP     R4,R3           ;CORRECT RESULT ?
003220  001402                         BEQ     T0010           ;BR IF YES

003222  000000                 E0007:  HALT                    ;ERROR-MOV FAILED
003224  000770                         BR      R0007           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL T0010 BASIC "CMP  RA,(RB)" TEST - [RA] = [DEST]
                                        ; ************************************************************************
                                        ;
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;
                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
                                        ;
                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016
                                        ;
                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=000000
                                        ;
                                        ;CODES:         [367]SPS=3       /      N:C=0100
                                        ;
                                        ;SYNC:          B05J2   (-)     T=2.6 USEC
                                        ;
                                        ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
                                        ;  K3-8 CINOO L
                                        ;
003226  012700  000010          T0010:  MOV     #0010,R0                ;LOAD R0 WITH TEST NO.
003232  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003236  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
003242  012737  125252  067602  R0010:  MOV     #125252,@#MBUF0 ;MAKE [DEST] = 125252
003250  000257                          CCC                     ;MAKE N:C=0000
                                        ;
003252  020412                  I0010:  CMP     R4,(R2)         ;TEST THE CMP
                                        ;
003254  001403                          BEQ     T0011           ;BR IF "Z" GOT SET
                                        ;
003256  011203                          MOV     (R2),R3         ;GET THE WAS DATA
003260  000000                  E0010:  HALT                    ;ERROR - CMP FAILED TO SET "Z"
003262  000767                          BR      R0010           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL TOO11 BASIC "CMP  RA,(RB)" TEST - [RA] NOT EQUAL TO  [DEST]
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
                                ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016
                                ;EXEC:          [224]ALUC=LLHHL :[367]D=177777
                                ;CODES:         [367]SPS=3      /      N:C=1001
                                ;SYNC:          B05J2   (-)     T=2.6 USEC
                                ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
                                ;  K3-8 CINOO L

003264  012700  000011         TOO11:  MOV     #0011,R0                ;LOAD R0 WITH TEST NO.
003270  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003274  012704  000001                 MOV     #1,R4           ;RESULT S / B = 000001
003300  012737  000000  067602 RO011:  MOV     #0,@#MBUF0      ;MAKE [DEST] = 000000
003306  000264                         SEZ                     ;MAKE N:C=0100

003310  020412                 IO011:  CMP     R4,(R2)         ;TEST THE CMP

003312  001003                         BNE     TOO12           ;BR IF "Z" GOT CLEARED

003314  011203                         MOV     (R2),R3         ;GET THE WAS DATA
003316  000000         EO011:  HALT                            ;ERROR - CMP FAILED TO CLR "Z"
003320  000767                 BR      RO011                   ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0012 BASIC "CMP #N,R" TEST - N = [R]
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 27[371]000,000
                                ;EXEC:          [371]ALUC=LLHHL :[362]D=125252
                                ;CODES:         [362] SPS=3  /  N:C=
                                ;SYNC:          B05J2 (-)       /       T= 2.5 USEC
                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=0L  /  K3-6 BYTE INSTR H
003322  012700  000012         T0012:  MOV     #0012,R0                ;LOAD R0 WITH TEST NO.
003326  012704  125252                 MOV     #125252,R4      ;RESULT S / B = 125252
003332  012702  177703                 MOV     #177703,R2      ;DEST ADDR = R3
003336  010403                 R0012:  MOV     R4,R3           ;[DEST] = 125252
003340  000257                         CCC                     ;SCOPE SYNC
003342  022703  125252         I0012:  CMP     #125252,R3      ;TEST THE CMP
003346  001402                         BEQ     A0012           ;BR IF N = [R]
003350  000000                 E10012: HALT                    ;CMP FAILED
003352  000771                         BR      R0012           ;LOCK ON HARD ERROR
003354  020403                 A0012:  CMP     R4,R3           ;DID CMP ALTER [DEST]?
003356  001402                         BEQ     T0013           ;BR IF NO
003360  000000                 E20012: HALT                    ;CMP DELIVERED A RESULT
003362  000765                         BR      R0012           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0013 BASIC "CMP #N,R" TEST - N NOT EQUAL TO [R]
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 27[371]000,000
                                ;
                                ;EXEC:          [371]ALUC=LLHHL :[362]D=177777
                                ;
                                ;CODES:         [362] SPS=3  /  N:C=1001
                                ;
                                ;SYNC:          B05J2 (-)       T=2.5 USEC
                                ;
                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=0L  /  K3-6 BYTE INSTR H  /  K3-8 CIN00 L
                                ;
003364  012700  000013        T0013:  MOV     #0013,R0                ;LOAD R0 WITH TEST NO.
003370  005004                        CLR     R4              ;RESULT S / B = 000000
003372  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
003376  010403                R0013:  MOV     R4,R3           ;[DEST] = 125252
003400  000264                        SEZ                     ;SCOPE SYNC
                                ;
003402  022703  000001        I0013:  CMP     #1,R3           ;TEST THE CMP
                                ;
003406  001002                        BNE     A0013           ;BR IF N NOT EQUAL TO [R]
                                ;
003410  000000                E10013: HALT                    ;CMP FAILED
003412  000771                        BR      R0013           ;LOCK ON HARD ERROR
                                ;
003414  020403                A0013:  CMP     R4,R3           ;DID CMP ALTER [DEST]?
003416  001402                        BEQ     T0014           ;BR IF NO
                                ;
003420  000000                E20013: HALT                    ;CMP DELIVERED A RESULT
003422  000765                        BR      R0013           ;LOCK ON HARD ERROR
                                ;
```

```
4499                                    ; ***************************************************************************
4500                                            .SBTTL T0014 BASIC "MOV  RA,(RB)" TEST
4501                                    ; ***************************************************************************
4502
4503                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4504
4505                                    ;ROM SEQ:       [171,257,201,125,375,016] FC 1,4,8
4506
4507                                    ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,016
4508
4509                                    ;EXEC:          [201]ALUC=LLLLL :[125]D=177777
4510
4511                                    ;CODES:         [125]SPS=3      /      N:C=1000
4512
4513                                    ;SYNC:          B05J2   (-)     T=2.42 USEC
4514
4515                                    ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L
4516
4517  003424  012700  000014           T0014:  MOV     #0014,R0                ;LOAD R0 WITH TEST NO.
4518  003430  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR=MBUF0
4519  003434  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
4520  003440  005012                   R0014:  CLR     (R2)            ;MAKE [DEST] = 000000
4521  003442  000257                           CCC                     ;SCOPE SYNC - N:C=0000
4522
4523  003444  010412                   I0014:  MOV     R4,(R2)         ;TEST THE MOV
4524
4525  003446  020412                           CMP     R4,(R2)         ;RESULT CORRECT ?
4526  003450  001403                           BEQ     T0015           ;BR IF  YES
4527
4528  003452  011203                           MOV     (R2),R3         ;GET THE WAS DATA
4529  003454  000000                   E0014:  HALT                    ;ERROR - MOV FAILED
4530  003456  000770                           BR      R0014           ;LOCK ON HARD ERROR
4531
```

```
4532                                    ; ***************************************************************************
4533                                            .SBTTL TOO15 BASIC "MOV  #N,(R)" TEST
4534                                    ; ***************************************************************************
4535
4536                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4537
4538                                    ;ROM SEQ        [142,240,250,171,257,200,125,375,016] FC 1,2,4,8
4539
4540                                    ;ACT BUTS:      37[004]100,142  /  35[240]120,171  /  22[171]200,200  /  16[125]016,016
4541
4542                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=177777
4543
4544                                    ;CODES:         [125]SPS=3      /      N:C=1000
4545
4546                                    ;SYNC:          B05J2   (-)     T=3.26 USEC
4547
4548                                    ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=2 L  /  K3-3 DM=1 L  /  K5-5 BCON(1+2) H
4549
4550  003460  012700  000015           TOO15:  MOV     #0015,R0                ;LOAD R0 WITH TEST NO.
4551  003464  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
4552  003470  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
4553  003474  005012                   ROO15:  CLR     (R2)            ;MAKE [DEST] = 000000
4554  003476  000257                           CCC                     ;SCOPE SYNC
4555
4556  003500  012712  177777           IOO15:  MOV     #-1,(R2)        ;TEST THE MOV
4557
4558  003504  020412                           CMP     R4,(R2)         ;RESULT OK ?
4559  003506  001403                           BEQ     TOO16           ;BR IF YES
4560
4561  003510  011203                           MOV     (R2),R3 ;GET THE WAS DATA
4562  003512  000000                   EOO15:  HALT                    ;ERROR - MOV FAILED
4563  003514  000767                           BR      ROO15           ;LOCK ON HARD ERROR
4564
4565
4566
```

```
                                ; ************************************************************************
                                        .SBTTL T0016 BASIC "MOVB #N,X(R)" TEST - DEST EVEN
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                ; / 16[125]016,016
                                ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
                                ;CODES:         [125] SPS=3  /  N:C=0000
                                ;SYNC:          BOSJ2 (-)       /       T= 4.2 USEC
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
003516  012700  000016          T0016:  MOV     #0016,R0                ;LOAD R0 WITH TEST NO.
003522  012704  177401                  MOV     #177401,R4      ;RESULT S / B = 177401
003526  012702  067606                  MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
003532  012705  067602                  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
003536  012712  177777          R0016:  MOV     #-1,(R2)        ;[DEST] = 177777
003542  000257                          CCC                     ;SCOPE SYNC
003544  112765  000001  000004  I0016:  MOVB    #1,4(R5)        ;TEST THE MOVB
003552  020412                          CMP     R4,(R2)         ;RESULT OK?
003554  001403                          BEQ     T0017           ;BR IF YES
003556  011203                          MOV     (R2),R3         ;GET WAS DATA
003560  000000          E0016:  HALT                            ;MOVB DELIVERED WRONG RESULT
003562  000765                  BR      R0016                   ;LOCK ON HARD ERROR
```

```
4602                                    ; ************************************************************************
4603                                    .SBTTL T0017 BASIC "MOVB #N,X(R)" TEST -,DEST ODD
4604                                    ; ************************************************************************
4605
4606                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4607
4608                                    ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4
4609
4610                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
4611                                    ; / 16[125]016,016
4612
4613                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
4614
4615                                    ;CODES:         [125] SPS=3  /  N:C=0000
4616
4617                                    ;SYNC:          BOSJ2 (-)       /       T= 4.2 USEC
4618
4619                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
4620
4621  003564  012700  000017            T0017:  MOV     #0017,R0                ;LOAD R0 WITH TEST NO.
4622  003570  012704  000777                    MOV     #777,R4         ;RESULT S / B = 777
4623  003574  012702  067606                    MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
4624  003600  012705  067602                    MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
4625  003604  012712  177777            R0017:  MOV     #-1,(R2)        ;[DEST] = 177777
4626  003610  000257                            CCC                     ;SCOPE SYNC
4627
4628  003612  112765  000001  000005    I0017:  MOVB    #1,5(R5)        ;TEST THE MOVB
4629
4630  003620  020412                            CMP     R4,(R2)         ;RESULT OK?
4631  003622  001403                            BEQ     CLMT            ;BR IF YES
4632
4633  003624  011203                            MOV     (R2),R3         ;GET WAS DATA
4634  003626  000000                    E0017:  HALT                    ;MOVB DELIVERED WRONG RESULT
4635  003630  000765                            BR      R0017           ;LOCK ON HARD ERROR
4636
4637                                    ;THIS ROUTINE CLEARS THE 512 BYTE MISSED TEST STATUS TABLE
4638
4639  003632  012701  070162            CLMT:   MOV     #STAB1,R1       ;R1 POINTS TO BEGINNING OF TABLE
4640  003636  012702  071204                    MOV     #STAB2,R2       ;R2 POINTS TO END OF TABLE
4641  003642  012721  000000            MT:     MOV     #0,(R1)+        ;CLEAR ONE WORD
4642  003646  020102                            CMP     R1,R2           ;AT END OF TABLE ?
4643  003650  001374                            BNE     MT              ;BR IF NOT AT END
4644
```

E10


```
                                ; ***************************************************************************
                                        .SBTTL T0020 BASIC "TST  @#A" TEST WITH [A]>0
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [163,264,265,266,267,220,211,367,376,016] FC 1,3,9,8
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016
                                ;EXEC:          [220]ALUC LLLLL :[211]D=377
                                ;CODES:         [367]SPS=3  /  N:C=0000
                                ;SYNC:          BOSJ2 (-)       /       T= 2.8 USEC
                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L
003652  012700  000020        T0020:  MOV     #0020,R0                ;LOAD R0 WITH TEST NO.
003656  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
003664  012703  066704                MOV     #FIRST,R3       ;R3 POINTS TO LOCATION THAT STORES NO OF FIRST TEST
003670  010013                        MOV     R0,(R3)         ;SAVE FIRST TEST NO. CHECKED
003672  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003676  012704  000377                MOV     #377,R4         ;RESULT S / B = 377 (NO CHANGE)
003702  010412                R0020:  MOV     R4,(R2)         ;[DEST] = 377
003704  000257                        CCC                     ;SCOPE SYNC
003706  005737  067602        I0020:  TST     @#MBUF0         ;TEST THE TST
003712  001401                        BEQ     E0020           ;BR IF "Z" SET - IT SHOULDN'T BE
003714  100002                        BPL     T0021           ;BR IF "N" CLEAR - IT SHOULD BE
003716  000000                E0020:  HALT                    ;TST FAILED TO ALTER CODES PROPERLY
003720  000770                        BR      R0020           ;LOCK ON HARD ERROR
```

F10

```
.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 123
DBQEAB.CMB      T0020 BASIC "TST  @#A" TEST WITH [A]>0

                                ; ************************************************************************
                                        .SBTTL T0021 BASIC "TST  @#A" TEST WITH [A] < 0
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8
                                ;ACT BUTS:      37[004]100,163  /  33[266]220,220  /  16[367]016,016
                                ;EXEC:          [220]ALUC=LLLLL :[211]D=100000
                                ;CODES:         [367]SP=3  /  N:C=1000
                                ;SYNC:          B05J2 (-)       /       T= 2.8 USEC
                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H
003722  012700  000021          T0021:  MOV     #0021,R0                ;LOAD R0 WITH TEST NO.
003726  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
003734  012702  067602          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003740  012704  100000          MOV     #100000,R4      ;MAKE S / B = 100000
003744  010412                  R0021:  MOV     R4,(R2)         ;MAKE [DEST] = 100000
003746  000257                  CCC                     ;SCOPE SYNC
003750  005737  067602          I0021:  TST     @#MBUF0         ;TEST THE TST
003754  001401                  BEQ     E10021          ;BR IF "Z" SET - IT SHOULDN'T BE
003756  100402                  BMI     A0021           ;BR IF "N" SET - IT SHOULD BE
003760  000000          E10021: HALT                    ;TST FAILED TO ALTER CODES PROPERLY
003762  000770                  BR      R0021           ;LOCK ON HARD ERROR
003764  020412          A0021:  CMP     R4,(R2)         ;DID TST DISTURB [DEST] ?
003766  001403                  BEQ     T0022           ;BR IF NOT
003770  011203                  MOV     (R2),R3         ;GET THE WAS DATA
003772  000000          E20021: HALT                    ;TST DELIVERED A RESULT
003774  000763                  BR      R0021           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0022 BASIC "TST  @#A" WITH [A] = 0
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8
                                ;
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016
                                ;
                                ;EXEC:          [220]ALUC=LLLLL :[211]D=000000
                                ;
                                ;CODES:         [367]SPS=3  /  N:C=0100
                                ;
                                ;SYNC:          B05J2 (-)       /       T=2.8 USEC
                                ;
                                ;KEY SIG:       K3-4 JSTL  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
                                ;
003776  012700  000022          T0022:  MOV     #0022,R0                ;LOAD R0 WITH TEST NO.
004002  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004010  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004014  005004                         CLR     R4              ;RESULT S / B = 0 (IT SHOULDN'T CHANGE
004016  005012                 R0022:  CLR     (R2)            ;[DEST] = 0
004020  000257                         CCC                     ;SCOPE SYNC - Z=0
                                ;
004022  005737  067602          I0022:  TST     @#MBUF0         ;TEST THE TST
                                ;
004026  001402                         BEQ     A0022           ;BR IF TST SET "Z"
                                ;
004030  000000                 E10022: HALT                    ;TST FAILED TO SET "Z"
004032  000771                         BR      R0022           ;LOCK ON HARD ERROR
                                ;
004034  020412                 A0022:  CMP     R4,(R2)         ;[DEST] STILL = 000000
004036  001403                         BEQ     T0023           ;BR IF YES
                                ;       ...
004040  011203                         MOV     (R2),R3         ;GET THE WAS DATA
004042  000000                 E20022: HALT                    ;TST ALTERED THE [DEST]
004044  000764                         BR      R0022           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL T0023 BASIC "TST  (R)+" TEST
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,8,9
                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016
                                ;EXEC:          [220]ALUC=LLLLL :[211]D=000000
                                ;CODES:         [367] SPS=3  /  N:C=0100
                                ;SYNC:          B05J2 (-)       /       T= 1.84 USEC
                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=2L  /  K5-2 PS(Z)(1)H
004046  012700  000023        T0023:  MOV     #0023,R0                ;LOAD R0 WITH TEST NO.
004052  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004060  012702  067602                MOV     #MBUF0,R2       ;INITIAL DEST ADDR = MBUF0
004064  005004                       CLR     R4              ;RESULT S / B = 0 (NO CHANGE)
004066  005012                R0023:  CLR     (R2)            ;MAKE [DEST] = 000000
004070  000257                        CCC                     ;SCOPE SYNC

004072  005722                I0023:  TST     (R2)+           ;TEST THE TST

004074  001402                        BEQ     A0023           ;BR IF "Z" SET - IT SHOULD BE

004076  000000                E10023: HALT                    ;TST FAILED TO SET "Z"
004100  000772                        BR      R0023           ;LOCK ON HARD ERROR

004102  022702  067604        A0023:  CMP     #MBUF0+2,R2     ;DID REG. GET AUTO-INCREMENTED ?
004106  001402                        BEQ     T0024           ;BR IF YES

004110  000000                E20023: HALT                    ;TST FAILED TO UPDATE REGISTER
004112  000765                        BR      R0023           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0024 BASIC "TST -(R)" TEST
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [164,260,267,220,211,367,375,016]
                                ;
                                ;ACT BUTS:      37[004]100,164 / 33[260]220,220 / 16[367]016,016
                                ;
                                ;EXEC:          [220]ALUC=LLLLL :[211]D=125252
                                ;
                                ;CODES:         [367] SPS=3  /  N:C=0000
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 1.84 USEC
                                ;
                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=4
004114  012700  000024          T0024:  MOV     #0024,R0                ;LOAD R0 WITH TEST NO.
004120  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004126  012702  067620                  MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
004132  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
004136  012705  067622          R0024:  MOV     #DWTA+10,R5     ;BASE DEST ADDR = DWTA+10
004142  000270                          SEN                     ;SCOPE SYNC
                                ;
004144  005745                  I0024:  TST     -(R5)           ;TEST THE TST
                                ;
004146  100002                          BPL     A0024           ;BR IF "N" CLEAR
                                ;
004150  000000                  E10024: HALT                    ;TST FAILED TO CLEAR "N"
004152  000771                          BR      R0024           ;LOCK ON HARD ERROR
                                ;
004154  020502                  A0024:  CMP     R5,R2           ;DID DEST REG GET DECREMENTED?
004156  001402                          BEQ     B0024           ;BR IF YES
                                ;
004160  000000                  E20024: HALT                    ;ERROR - TST FAILED TO UPDATE DEST REG
004162  000765                          BR      R0024           ;LOCK ON HARD ERROR
                                ;
004164  020412                  B0024:  CMP     R4,(R2)         ;DID TST ALTER [DEST]?
004166  001404                          BEQ     T0025           ;BR IF NOT
                                ;
004170  011203                          MOV     (R2),R3         ;GET WAS DATA
004172  000000                  E30024: HALT                    ;TST ALTERED [DEST]
004174  010412                          MOV     R4,(R2)         ;RESTORE [DEST]
004176  000757                          BR      R0024           ;LOCK ON HARD ERROR
                                ;
```

```
4842                                    ; ***************************************************************************
4843                                            .SBTTL T0025 BASIC "COM  @#A" TEST
4844                                    ; ***************************************************************************
4845
4846                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
4847
4848                                    ;ROM SEQ:       [163,264,265,266,267,220,211,267,375,016] FC 1,3,9,8
4849
4850                                    ;ACT BUS:       37[004]100,163  /  33[266]220,220  /  16 [367]016,016
4851
4852                                    ;EXEC:          [220]ALUC=HLLLL :[211]D=177777
4853
4854                                    ;CODES:         [367] SPS=3  /  N:C=1001
4855
4856                                    ;SYNC:          B05J2 (-)       /       T= 2.8 USEC
4857
4858                                    ;KEY SIG:       K3-4 COM L  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H  /  K5-2 PS(C)(1)H
4859
4860  004200  012700  000025          T0025:  MOV     #0025,R0                ;LOAD R0 WITH TEST NO.
4861  004204  112760  000377  070162          MOVB    #377,$TAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
4862  004212  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
4863  004216  005004                          CLR     R4              ;RESULT S / B = 177777
4864  004220  005104                          COM     R4
4865  004222  005012                  R0025:  CLR     (R2)            ;MAKE [DEST] = 000000
4866  004224  000257                          CCC                     ;SCOPE SYNC
4867
4868  004226  005137  067602          I0025:  COM     @#MBUF0 ;TEST THE COM
4869
4870  004232  020412                          CMP     R4,(R2)         ;RESULT = 177777 ??
4871  004234  001403                          BEQ     T0026           ;BR IF YES
4872
4873  004236  011203                  E0025:  MOV     (R2),R3         ;GET THE WAS DATA
4874  004240  000000                          HALT                    ;COM DELIVERED THE WRONG RESULT
4875  004242  000767                          BR      R0025
4876
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0026 BASIC "INC  @#A" TEST
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016
                                ;EXEC:          [220]ALUC=LLLLL :[211]D=100
                                ;CODES:         [367] SPS=3  /  N:C=0000
                                ;SYNC:          B05J2 (-)       /       T= 2.8 USEC
                                ;KEY SIG:       K3-4 INC L  /  K3-3 DM=3L  /  K3-8 CIN 00 L
004244  012700  000026         T0026:  MOV     #0026,R0                ;LOAD R0 WITH TEST NO.
004250  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004256  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004262  012704  000100                 MOV     #100,R4         ;RESULT S / B = 100
004266  012712  000077         R0026:  MOV     #77,(R2)        ;[DEST] = 77
004272  000257                         CCC                     ;SCOPE SYNC
004274  005237  067602         I0026:  INC     @#MBUF0         ;TEST THE INC
004300  020412                         CMP     R4,(R2)         ;DID RESULT = 100 ??
004302  001403                         BEQ     T0027           ;BR IF YES
004304  011203                         MOV     (R2),R3         ;GET THE WAS DATA
004306  000000         E0026:  HALT                            ;INC DELIVERED WRONG RESULT
004310  000766                 BR      R0026           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL T0027 BASIC "DEC  RN" TEST
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8
                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
                                        ;EXEC:          [104]ALUC=LHHHH :[373]D=000000
                                        ;CODES:         [367] SPS=3  /  N:C=0100
                                        ;SYNC:          B05J2 (-)       /       T= 1 USEC
                                        ;KEY SIG:       K3-4 DEC L  /  K3-4 OVLAP INSTR H  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H
004312  012700  000027          T0027:  MOV     #0027,R0                ;LOAD R0 WITH TEST NO.
004316  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004324  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
004330  005004                          CLR     R4              ;RESULT S / B = 000000
004332  012703  000001          R0027:  MOV     #1,R3           ;[DEST0030
004336  000257                          CCC                     ;SCOPE SYNC
004340  005303                  I0027:  DEC     R3              ;TEST THE DEC
004342  005703                          TST     R3              ;RESULT = 000000 ??
004344  001402                          BEQ     T0030           ;BR IF YES
004346  000000                  E0027:  HALT                    ;DEC DELIVERED THE WRONG RESULT
004350  000770                          BR      R0027           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                        .SBTTL T0030 BASIC "DEC  @#A" TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHHH :[211]D=177777

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T=2.8 USEC

                                        ;KEY SIG:       K3-4 DEC L  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H

004352  012700  000030          T0030:  MOV     #0030,R0                ;LOAD R0 WITH TEST NO.
004356  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004364  012704  177777                 MOV     #-1,R4          ;RESULT S / B = 177777
004370  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004374  005012                 R0030:  CLR     (R2)            ;MAKE [DEST] = 000000
004376  000257                         CCC                     ;SCOPE SYNC

004400  005337  067602          I0030:  DEC     @#MBUF0         ;TEST THE DEC

004404  020412                         CMP     R4,(R2)         ;DID RESULT = 177777 ??
004406  001403                         BEQ     T0031           ;BR IF YES

004410  011203                         MOV     (R2),R3         ;[R3] = WAS DATA
004412  000000                 E0030:  HALT                    ;DEC DELIVERED WRONG RESULT
004414  000767                         BR      R0030           ;LOCK ON HARD ERROR
```

```
                                ; ******************************************************************************
                                ;       .SBTTL T0031 BASIC "CLR X(R)" TESTS
                                ; ******************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [167,261,262,266,267,220,211,367,375,016] FC 1,3,9,8
                                ;
                                ;ACT BUTS:      37[004]100,167 / 17[167]262,262 / 33[266]220,220 / 16[367]016,016
                                ;
                                ;EXEC:          [220]ALUC HLLHH :[211]D=000000
                                ;
                                ;CODES:         [367] SPS=3  /  N:C=0100
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 2.5 USEC
                                ;
                                ;KEY SIG:       K3-3 DM=6L  /  K3-4 CLRL
                                ;
004416  012700  000031          T0031:  MOV     #0031,R0                ;LOAD R0 WITH TEST NO.
004422  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004430  012702  067604                  MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0+2
004434  005004                         CLR     R4              ;RESULT S / B = 000000
004436  012705  067602          R0031:  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
004442  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
004446  000257                         CCC                     ;SCOPE SYNC
                                ;
004450  005065  000002          I0031:  CLR     2(R5)           ;TEST THE CLR
                                ;
004454  020412                         CMP     R4,(R2)         ;RESULT = 0?
004456  001403                         BEQ     T0032           ;BR IF YES
                                ;
004460  011203                         MOV     (R2),R3         ;GET WAS DATA
004462  000000                 E0031:  HALT                    ;CLR FAILED TO ZERO [DEST]
004464  000764                         BR      R0031           ;LOCK ON HARD ERROR.
                                ;
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0032 BASIC "ASL  RN" TEST WITH [DEST]=125252 AND C(0)
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [104,373,360,000] FC 1,7,8
                                ;ACT BUTS:      37[004]160,104 / 31[104]360,360 / 27[373]000,000
                                ;EXEC:          [104]ALUC=LHHLL :[373]D=52524
                                ;CODES:         [360] SPS=3  /  N:C=0001
                                ;SYNC:          BOSJ2 (-)       /       T= 1 USEC
                                ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS (C)(1)H
004466  012700  000032        T0032:  MOV     #0032,R0                ;LOAD R0 WITH TEST NO.
004472  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004500  012704  052524                MOV     #52524,R4       ;RESULT S / B = 52524
004504  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
004510  012703  125252        R0032:  MOV     #125252,R3      ;MAKE [DEST] = 125252
004514  000257                        CCC                     ;MAKE C=0
004516  006303                I0032:  ASL     R3              ;TEST THE ASL - IT SHOULD SET "C"
004520  103402                        BCS     A0032           ;BR IF "C" GOT SET
004522  000000                E10032: HALT                    ;ASL FAILED TO SET "C" BIT
004524  000771                        BR      R0032           ;LOCK ON HRD ERROR
004526  020403                A0032:  CMP     R4,R3           ;WAS RESULT = 52524 ??
004530  001402                        BEQ     T0033           ;BR IF YES
004532  000000                E20032: HALT                    ;ASL DELIVERED THE WRONG RESULT
004534  000765                        BR      R0032           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0033 BASIC "ASL  RN" TEST WITH [DEST]=052525 AND C(1)
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [104,373,360,000] FC 1,7,8]
                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000
                                ;EXEC:          [104]ALUC=LHHLL :[373]D=125252
                                ;CODES:         [360] SPS=3  /  N:C=1000
                                ;SYNC:          B05J2 (-)       /       T= 1 USEC
                                ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(N)(1)H
004536  012700  000033        T0033:  MOV     #0033,R0                ;LOAD R0 WITH TEST NO.
004542  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004550  012704  125252                MOV     #125252,R4      ;RESULT S / B = 125252
004554  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
004560  012703  052525        R0033:  MOV     #052525,R3      ;MAKE [DEST] = 052525
004564  000261                SEC                             ;MAKE C=1

004566  006303                I0033:  ASL     R3              ;TEST THE ASL - IT SHOULD CLR "C"

004570  103002                        BCC     A0033           ;BR IF "C" GOT CLEARED

004572  000000                E10033: HALT
004574  000771                        BR      R0033           ;LOCK ON HARD ERROR

004576  020403                A0033:  CMP     R4,R3           ;RESULT = 125252 ??
004600  001402                        BEQ     T0034           ;BR IF YES

004602  000000                E20033: HALT
004604  000765                        BR      R0033           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0034 BASIC "ROL  RN" TEST WITH [DEST]=125252 AND C(0)
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [104,373,360,000] FC 1,7,8
                                ;
                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000
                                ;
                                ;EXEC:          [104]ALUC=LHHLL :[373]D=052524
                                ;
                                ;CODES:         [360] SPS=3  /  N:C=0001
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 1 USEC
                                ;
                                ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(C)(1)H
                                ;
004606  012700  000034          T0034:  MOV     #0034,R0                ;LOAD R0 WITH TEST NO.
004612  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004620  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
004624  012704  052524                  MOV     #052524,R4      ;RESULT S / B = 052524
004630  012703  125252          R0034:  MOV     #125252,R3      ;MAKE [DEST] = 125252
004634  000257                          CCC                     ;MAKE C=0
                                ;
004636  006103                  I0034:  ROL     R3              ;TEST THE ROL - IT SHOULD SET C
                                ;
004640  103402                          BCS     A0034           ;BR IF "C" GOT SET
                                ;
004642  000000                  E10034: HALT                    ;ROL FAILED TO SET "C"
004644  000771                          BR      R0034           ;LOCK ON HARD ERROR
                                ;
004646  020403                  A0034:  CMP     R4,R3           ;RESULT = 052524 ??
004650  001402                          BEQ     T0035           ;BR IF YES
                                ;
004652  000000                  E20034: HALT                    ;ROL DELIVERED WRONG RESULT
004654  000765                          BR      R0034           ;LOCK ON HARD ERROR
                                ;
```

E11


```
                                ; ************************************************************************
                                ;       .SBTTL T0035 BASIC "ROL  RN" TEST WITH [DEST]=052524 AND C(1)
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [104,373,360,000] FC 1,7,8
                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000
                                ;EXEC:          [104]ALUC=LHHLL :[373]D=125251
                                ;CODES:         [360] SPS=3  /  N:C=1000
                                ;SYNC:          BOSJ2 (-)       /       T= 1 USEC
                                ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(N)(1)H
004656  012700  000035        T0035:  MOV     #0035,R0                ;LOAD R0 WITH TEST NO.
004662  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004670  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
004674  012704  125251                MOV     #125251,R4      ;RESULT S / B = 125251
004700  012703  052524        R0035:  MOV     #052524,R3      ;MAKE [DEST] = 052524
004704  000261                        SEC                     ;MAKE C=1

004706  006103                I0035:  ROL     R3              ;TEST THE ROL - IT SHOULD CLEAR C

004710  103002                        BCC     A0035           ;BR IF "C" IS CLEAR

004712  000000                E10035: HALT                    ;ROL FAILED TO CLEAR "C"
004714  000771                        BR      R0035           ;LOCK ON HARD ERROR

004716  020403                A0035:  CMP     R4,R3           ;RESULT = 125251 ??
004720  001402                        BEQ     T0036           ;BR IF YES

004722  000000                E20035: HALT                    ;ROL DELIVERED WRONG RESULT
004724  000765                        BR      R0035           ;LOCK ON HARD ERROR
```

```
5164                                    ; ***************************************************************************
5165                                    .SBTTL T0036 BASIS "TSTB (R)" TEST - EVEN ADDRESS
5166                                    ; ***************************************************************************
5167
5168                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5169
5170                                    ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
5171
5172                                    ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
5173
5174                                    ;EXEC:          [220]ALUC=LLLLL :[211]D=000377
5175
5176                                    ;CODES:         [367] SPS=3  /  N:C=1000
5177
5178                                    ;SYNC:          BOSJ2 (-)       /       T= 1.8 USEC
5179
5180                                    ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=1L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H
5181
5182  004726  012700  000036      T0036:  MOV     #0036,R0                ;LOAD R0 WITH TEST NO.
5183  004732  112760  000377  070162      MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5184  004740  012702  067620              MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
5185  004744  012704  000377              MOV     #377,R4         ;RESULT S / B = 377
5186  004750  000257               R0036:  CCC                     ;SCOPE SYNC
5187
5188  004752  105712               I0036:  TSTB    (R2)            ;TEST THE TSTB
5189
5190  004754  100402                       BMI     A0036           ;BR IF "N" SET - IT SHOULD BE
5191
5192  004756  000000               E10036: HALT                    ;TSTB FAILED TO SET "N"
5193  004760  000773                       BR      R0036           ;LOCK ON HARD ERROR
5194
5195  004762  020412               A0036:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]
5196  004764  001404                       BEQ     T0037           ;BR IF NOT
5197
5198  004766  011203                       MOV     (R2),R3         ;GET WAS DATA
5199  004770  000000               E20036: HALT                    ;TSTB ALTERED [DEST]
5200  004772  010412                       MOV     R4,(R2)         ;RESTORE [DEST]
5201  004774  000765                       BR      R0036           ;LOCK ON HARD EROR
```

```
5202                                    ; ***************************************************************************
5203                                    .SBTTL T0037 BASIS "TSTB (R)" TEST - ODD ADDRESS
5204                                    ; ***************************************************************************
5205
5206                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5207
5208                                    ;ROM SEQ:       [161,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8
5209
5210                                    ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016
5211
5212                                    ;EXEC:          [222]ALUC=LLLLL :[253]D=000377
5213
5214                                    ;CODES:         [075] SPS=3  /  N:C=1000
5215
5216                                    ;SYNC:          BOSJ2 (-)       /       T= 1.9 USEC
5217
5218                                    ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=1L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H
5219
5220  004776  012700  000037           T0037:  MOV     #0037,R0                ;LOAD R0 WITH TEST NO.
5221  005002  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5222  005010  012702  070144                   MOV     #DWTB+6,R2      ;DEST ADDR = DWTB+6
5223  005014  012704  177401                   MOV     #177401,R4      ;RESULT S / B = 177401
5224  005020  012703  070145                   MOV     #DWTB+7,R3      ;DEST ADDR USED = DWTB+7
5225  005024  000257                   R0037:  CCC                     ;SCOPE SYNC
5226
5227  005026  105713                   I0037:  TSTB    (R3)            ;TEST THE TSTB
5228
5229  005030  100402                           BMI     A0037           ;BR IF "N" SET - IT SHOULD BE
5230
5231  005032  000000                   E10037: HALT                    ;TSTB FAILED TO SET "N"
5232  005034  000773                           BR      R0037           ;LOCK ON HARD ERROR
5233
5234  005036  020412                   A0037:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]
5235  005040  001404                           BEQ     T0040           ;BR IF NOT
5236
5237  005042  011203                           MOV     (R2),R3         ;GET WAS DATA
5238  005044  000000                   E20037: HALT                    ;TSTB ALTERED [DEST]
5239  005046  010412                           MOV     R4,(R2)         ;RESTORE [DEST]
5240  005050  000765                           BR      R0037           ;LOCK ON HARD EROR
5241
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0040 BASIC "TSTB @#A" TEST - EVEN ADDRESS
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [163,264,265,266,267,225,367,375,016] FC 1,3,9,8
                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016
                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=177400
                                        ;CODES:         [075] SPS=3  /  N:C=0100
                                        ;SYNC:          BOSJ2 (-)       /       T= 2.8 USEC
                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H  /  K3-6 BYTE INSTR H
005052  012700  000040          T0040:  MOV     #0040,R0                ;LOAD R0 WITH TEST NO.
005056  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005064  032737  000001  066642          BIT     #1,@#BPTLOC     ;BREAKPOINT HALT SET ??
005072  001401                          BEQ     .+4             ;BR IF NOT
005074  000000                          HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
005076  012702  067616                  MOV     #DWTA+4,R2      ;DEST ADDR = DWTA+4
005102  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
005106  000257                  R0040:  CCC                     ;SCOPE SYNC

005110  105737  067616          I0040:  TSTB    @#DWTA+4        ;TEST THE TSTB

005114  001402                          BEQ     A0040           ;BR IF "Z" SET - IT SHOULD BE

005116  000000                  E10040: HALT                    ;TSTB FAILED TO SET "Z"
005120  000772                          BR      R0040           ;LOCK ON HARD ERROR

005122  020412                  A0040:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]?
005124  001404                          BEQ     T0041           ;BR IF NOT

005126  011203                          MOV     (R2),R3         ;GET WAS DATA
005130  000000                  E20040: HALT                    ;TSTB ALTERED [DEST]
005132  010412                          MOV     R4,(R2)         ;RESTORE [DEST]
005134  000764                          BR      R0040           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0041 BASIC "TSTB @#A" TEST - ODD ADDRESS
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [163,264,265,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8
                                ;
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016
                                ;
                                ;EXEC:          [222]ALUC=LLLLL :[253]D=000377
                                ;
                                ;CODES:         [075] SPS=3  /  N:C=0100
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 2.8 USEC
                                ;
                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H  /  K3-6 BYTE INSTR H
                                ;
005136  012700  000041        T0041:  MOV     #0041,R0                ;LOAD R0 WITH TEST NO.
005142  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005150  012702  067620                MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
005154  012704  000377                MOV     #377,R4         ;RESULT S / B = 377
005160  000257                R0041:  CCC                     ;SCOPE SYNC
                                ;
005162  105737  067621        I0041:  TSTB    @#DWTA+7        ;TEST THE TSTB
                                ;
005166  001402                        BEQ     A0041           ;BR IF "Z" SET - IT SHOULD BE
                                ;
005170  000000                E10041: HALT                    ;TSTB FAILED TO SET "Z"
005172  000772                        BR      R0041           ;LOCK ON HARD ERROR
                                ;
005174  020412                A0041:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]?
005176  001404                        BEQ     T0042           ;BR IF NOT
                                ;
005200  011203                        MOV     (R2),R3         ;GET WAS DATA
005202  000000                E20041: HALT                    ;TSTB ALTERED [DEST]
005204  010412                        MOV     R4,(R2)         ;RESTORE [DEST]
005206  000764                        BR      R0041           ;LOCK ON HARD ERROR
                                ;
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0042 BASIC "DECB 1(SP)"
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [167,261,262,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8
                                        ;ACT BUTS:      37[004]100,167 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016
                                        ;EXEC:          [222]ALUC=LHHHH :[253]D=177400
                                        ;CODES:         [075] SPS=3  /  N:C=1000
                                        ;SYNC:          BOSJ2 (-)       /       T= 2.8 USEC
                                        ;KEY SIG:       K3-4 DEC L  /  K3-3 DM=6L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H
005210  012700  000042          T0042:  MOV     #0042,R0                ;LOAD R0 WITH TEST NO.
005214  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005222  010605                  MOV     SP,R5           ;SAVE SP
005224  012704  177400          MOV     #177400,R4      ;RESULT S / B = 177400
005230  010506                  R0042:  MOV     R5,SP
005232  012746  000000          MOV     #0,-(SP)        ;[DEST] = 000000
005236  000257                  CCC                     ;SCOPE SYNC
005240  105366  000001          I0042:  DECB    1(SP)           ;TEST THE DECB
005244  020416                  CMP     R4,(SP)         ;RESULT = 177400?
005246  001405                  BEQ     A0042           ;BR IF YES
005250  011603                  MOV     (SP),R3         ;GET WAS DATA
005252  010602                  MOV     SP,R2           ;GENERATE DEST ADDR IN R2
005254  005202                  INC     R2
005256  000000          E0042:  HALT                    ;ERROR - DECB FAILED
005260  000763                  BR      R0042           ;LOCK ON HARD ERROR
005262  010506          A0042:  MOV     R5,SP           ;RESET THE SP
```

```
5362                                    ; ************************************************************************
5363                                    .SBTTL T0043 BASIC "MOV @#A,R" TEST
5364                                    ; ************************************************************************
5365
5366                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5367
5368                                    ;ROM SEQ:       [143,245,246,247,250,160,204,000] FC 1,2,4
5369
5370                                    ;ACT BUTS:      37[004]100,143 / 35[247]120,160 / 20[160]000,000
5371
5372                                    ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA
5373
5374                                    ;CODES:         [204] SPS=3  /  N:C=0000
5375
5376                                    ;SYNC:          B05J2 (-)       /       T= 3.2 USEC
5377
5378                                    ;KEY SIG:       K3-3 MOV L  /  K3-3 DM=0L  /  K3-5 DOPL
5379
5380  005264  012700  000043           T0043:  MOV     #0043,R0                ;LOAD R0 WITH TEST NO.
5381  005270  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5382  005276  012702  177703                   MOV     #177703,R2      ;DEST ADDR = 3
5383  005302  012704  067612                   MOV     #DWTA,R4        ;RESUTL S / B = #DWTA
5384  005306  005003                   R0043:  CLR     R3              ;[DEST] = 000000
5385  005310  000257                           CCC                     ;SCOPE SYNC
5386
5387  005312  013703  067566           I0043:  MOV     @#ATA,R3        ;TEST THE MOV
5388
5389  005316  020403                           CMP     R4,R3           ;RESULT = DWTA?
5390  005320  001402                           BEQ     T0044           ;BR IF YES
5391
5392  005322  000000                   E0043:  HALT                    ;MOV FAILED TO DELIVER CORRECT RESULT
5393  005324  000770                           BR      R0043           ;LOCK ON HARD ERROR
5394
```

```
5395                                    ; ***************************************************************************
5396                                          .SBTTL T0044 BASIC "MOV #N,X(R)" TEST
5397                                    ; ***************************************************************************
5398
5399                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5400
5401                                    ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8
5402
5403                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 16[125]016,016
5404
5405                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=125252
5406
5407                                    ;CODES:         [125] SPS=3  /  N:C=0000
5408
5409                                    ;SYNC:          B05J2 (-)       /       T= 4 USEC
5410
5411                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0  /  K3-5 DOPL
5412
5413  005326  012700  000044            T0044:  MOV     #0044,R0                ;LOAD R0 WITH TEST NO.
5414  005332  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5415  005340  012702  067604                    MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0+2
5416  005344  012704  125252                    MOV     #125252,R4      ;RESULT S / B = 125252
5417  005350  012703  067602            R0044:  MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
5418  005354  005012                            CLR     (R2)            ;[DEST] = 000000
5419  005356  000257                            CCC                     ;SCOPE SYNC
5420
5421  005360  012763  125252  000002    I0044:  MOV     #125252,2(R3)   ;TEST THE MOV
5422
5423  005366  020412                            CMP     R4,(R2)         ;RESULT OK?
5424  005370  001403                            BEQ     T0045           ;BR IF YES
5425
5426  005372  011203                            MOV     (R2),R3         ;GET WAS DATA
5427  005374  000000                    E0044:  HALT                    ;MOV DELIVERED WRONG RESULT
5428  005376  000764                            BR      R0044           ;LOCK ON HARD ERROR
5429
```

```
                                ; ***************************************************************************
                                        .SBTTL T0045 BASIC "MOV #N,(R)" TEST
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=125252

                                ;CODES:         [125] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T= 2.3 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=1L  /  K3-5 DOPL  /  K5-2 PS (N)(1)H

005400  012700  000045         T0045:  MOV     #0045,R0                ;LOAD R0 WITH TEST NO.
005404  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005412  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
005416  012704  125252                 MOV     #125252,R4      ;RESULT S / B = 125252
005422  010203                 R0045:  MOV     R2,R3           ;R3 GETS DEST ADDR
005424  005013                         CLR     (R3)            ;[DEST] = 000000
005426  000257                         CCC                     ;SCOPE SYNC

005430  012713  125252         I0045:  MOV     #125252,(R3)    ;TEST THE MOV

005434  020412                         CMP     R4,(R2)         ;RESULT OK?
005436  001403                         BEQ     T0046           ;BR IF YES

005440  011203                         MOV     (R2),R3         ;GET WAS DATA
005442  000000                 E0045:  HALT                    ;MOV DELIVERED WRONG RESULT
005444  000766                         BR      R0045           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0046 BASIC "MOV (RA)+,RB" TEST
                                ; ************************************************************************
                                
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                
                                ;ROM SEQ:       [142,240,250,160,204,000] FC 1,2,4
                                
                                ;ACT BUTS:      37[004]100,142 /  35[240]120,160 / 20[160]000,000
                                
                                ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA
                                
                                ;CODES:         [204] SPS=3  /  N:C=0000
                                
                                ;SYNC:          B05J2 (-)       /       T= 2.3 USEC
                                
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K3-5 DOPL
                                
005446  012700  000046        T0046:  MOV     #0046,R0                ;LOAD R0 WITH TEST NO.
005452  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005460  012704  067612                MOV     #DWTA,R4        ;RESULT S / B = #DWTA
005464  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
005470  012705  067566        R0046:  MOV     #ATA,R5         ;SRC ADDR = ATA
005474  005003                        CLR     R3              ;[DEST] = 000000
005476  000257                        CCC                     ;SCOPE SYNC
                                
005500  012503                I0046:  MOV     (R5)+,R3        ;TEST THE MOV
                                
005502  020403                        CMP     R4,R3           ;RESULT OK?
005504  000402                        BR      A0046           ;BR IF YES
                                
005506  000000                E10046: HALT                    ;MOV DELIVERED WRONG RESULT
005510  000767                        BR      R0046           ;LOCK ON HARD ERROR
                                
005512  022705  067570        A0046:  CMP     #ATA+2,R5       ;DID SRC REG GET INCREMENTED?
005516  001402                        BEQ     T0047           ;BR IF YES
                                
005520  000000                E20046: HALT                    ;MOV FAILED TO UPDATE SRC. REG.
005522  000762                        BR      R0046           ;LOCK ON HARD ERROR
```

```
5505                                    ; ***************************************************************************
5506                                            .SBTTL T0047 BASIC "MOV  @#A,@#B"
5507                                    ; ***************************************************************************
5508
5509                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5510
5511                                    ;ROM SEQ:       [143,245,256,247,250,173,207,210,200,125,375,016] FC 1,2,4
5512
5513                                    ;ACT BUTS:      37[004]100,143 / 35[247]120,173 . 22[207]200,200 / 16[125]016,016
5514
5515                                    ;EXEC:          [200]ALUC=LLLLL :[125]ID=#DWTA
5516
5517                                    ;CODES:         [125] SPS=3  /  N:C=0000
5518
5519                                    ;SYNC:          B05J2 (-)      /       T= 5 USEC
5520
5521                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=3L
5522
5523  005524  012700  000047            T0047:  MOV     #0047,R0                ;LOAD R0 WITH TEST NO.
5524  005530  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5525  005536  012702  067606                    MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
5526  005542  012704  067612                    MOV     #DWTA,R4        ;RESULT S / B = #DWTA
5527  005546  005012                    R0047:  CLR     (R2)            ;MAKE [DEST] = 000000
5528  005550  000257                            CCC                     ;SCOPE SYNC
5529
5530  005552  013737  067566  067606    I0047:  MOV     @#ATA,@#MBUF1   ;TEST THE MOV
5531  005560  020412                            CMP     R4,(R2)         ;DID RESULT = #DWTA ?
5532  005562  001403                            BEQ     T0050           ;BR IF YES
5533
5534  005564  011203                            MOV     (R2),R3         ;GET THE WAS DATA
5535  005566  000000                    E0047:  HALT                    ;MOV DELIVERED THE WRONG RESULT
5536  005570  000766                            BR      R0047           ;LOCK ON HARD ERROR
5537
```

```
5538                                    ; ***************************************************************************
5539                                    .SBTTL T0050 BASIC "MOV   X(R),PC" TEST
5540                                    ; ***************************************************************************
5541
5542                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5543
5544                                    ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4
5545
5546                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000
5547
5548                                    ;EXEC:          [160]ALUC=LLLLL :[204]D=#T077
5549
5550                                    ;CODES:         [204] SPS=3  /  N:C=0000
5551
5552                                    ;SYNC:          B05J2 (-)       /       T= 4 USEC
5553
5554                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L  /  K3-4 IR (02:00)=7L
5555
5556  005572  012700  000050           T0050:  MOV     #0050,R0                ;LOAD R0 WITH TEST NO.
5557  005576  112760  000377  070162           MOVB    #377,$TAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5558  005604  012705  005612           R0050:  MOV     #I0050,R5       ;[R5] = I0050 (BASE ADDRESS)
5559  005610  000257                           CCC                     ;SCOPE SYNC
5560
5561  005612  016507  000010           I0050:  MOV     A0050-I0050(R5),PC      ;TEST THE MOV - GO TO A0050
5562
5563  005616  000000                   E0050:  HALT                    ;MOV FAILED TO LOAD THE PC
5564  005620  000771                           BR      R0050           ;LOCK ON HARD ERROR
5565
5566  005622  005624                   A0050:    T0051                         ;POINTER TO NEXT TEST
5567
```

```
                                ; ************************************************************************
                                        .SBTTL T0051 BASIC "MOV  @#A,(R)" TEST
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [143,245,246,247,250,171,257,200,125,375,016] FC 1,2,4
                                ;
                                ;ACT BUTS:      37[004]100,143 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016
                                ;
                                ;EXEC:  [200]ALUC=LLLLL :[125]D=051300
                                ;
                                ;CODES: [125] SPS=3  /  N:C=0000
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 4.2 USEC
                                ;
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=1L
                                ;
005624  012700  000051          T0051:  MOV     #0051,R0                ;LOAD R0 WITH TEST NO.
005630  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005636  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
005642  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
005646  005012                  R0051:  CLR     (R2)            ;MAKE [DEST]=000000
005650  000257                          CCC                     ;SCOPE SYNC - Z=0
                                ;
005652  013712  067566          I0051:  MOV     @#ATA,(R2)      ;TEST THE MOV
                                ;
005656  020412                          CMP     R4,(R2)         ;DID RESULT = #DWTA ??
005660  001403                          BEQ     T0052           ;BR IF YES
                                ;
005662  011203                          MOV     (R2),R3         ;GET THE WAS DATA
005664  000000                  E0051:  HALT                    ;MOV DELIVERED WRONG RESULT
005666  000767                          BR      R0051           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0052 BASIC "MOV  X(RA),RB" TEST
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4
                                ;
                                ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000
                                ;
                                ;EXEC:          [160]ALUC=LLLLL :[204]D=#DBTA
                                ;
                                ;CODES:         [204] SPS=3  /  N:C=0000
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 3 USEC
                                ;
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L
                                ;
005670  012700  000052          T0052:  MOV     #0052,R0                ;LOAD R0 WITH TEST NO.
005674  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005702  012704  070152                  MOV     #DBTA,R4        ;RESULT S / B = #DBTA
005706  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
005712  012705  067566                  MOV     #ATA,R5         ;[R5] = BASE ADDR FOR SOURCE (ATA)
005716  005003                  R0052:  CLR     R3              ;MAKE [DEST] = 000000
005720  000257                          CCC                     ;SCOPE SYNC
                                ;
005722  016503  000004          I0052:  MOV     4(R5),R3        ;TEST THE MOV
                                ;
005726  020403                          CMP     R4,R3           ;RESULT = #DBTA ??
005730  001402                          BEQ     T0053           ;BR IF YES
                                ;
005732  000000                  E0052:  HALT                    ;MOV DELIVERED WRONG RESULT
005734  000770                          BR      R0052           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                ;       .SBTTL TOO53 BASIC "MOV  RA,-(RB)" TEST
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [174,257,201,125,375,016] FC 1,4
                                ;
                                ;ACT BUTS:      37[004]100,174 / 22[174]200,201 / 16[125]016,016
                                ;
                                ;EXEC:          [201]ALUC=LLLLL :[125]D=125252
                                ;
                                ;CODES:         [125] SPS=3  /  N:C=1000
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 1.8 USEC
                                ;
                                ;KEY SIG:       K-3 MOVL  /  K3-3 SM=OL  /  K3-3 DM=4L  /  K5-2 PS(N)(1)H
005736  012700  000053        TOO53:  MOV     #0053,R0                ;LOAD R0 WITH TEST NO.
005742  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005750  012702  067602                MOV     #MBUF0,R2       ;FINAL DEST ADDR = MBUF0
005754  012704  125252                MOV     #125252,R4      ;RESULT S / B = 125252
005760  012705  067604        R0053:  MOV     #MBUF0+2,R5     ;INITIAL DEST ADDR = TEMP2 + 2
005764  005012                        CLR     (R2)            ;MAKE [DEST] = 000000
005766  000257                        CCC                     ;SCOPE SYNC
                                ;
005770  010445                I0053:  MOV     R4,-(R5)        ;TEST THE MOV
                                ;
005772  020412                        CMP     R4,(R2)         ;RESULT = 125252
005774  001403                        BEQ     A0053           ;BR IF YES
                                ;
005776  011203                        MOV     (R2),R3         ;GET THE S / B DATA
006000  000000        E10053: HALT                            ;MOV DELIVERED THE WRONG ESULT
006002  000766                BR      R0053                   ;LOCK ON HARD ERROR
                                ;
006004  020205        A0053:  CMP     R2,R5           ;DID REGISTER GET DECREMENTED ?
006006  001402                BEQ     T0054           ;BR IF YES
                                ;
006010  000000        E20053: HALT                            ;MOV FAILED TO UPDATE REGISTER
006012  000762                BR      R0053           ;LOCK ON HARD ERROR
```

```
5678                                    ; ***************************************************************************
5679                                    .SBTTL TD054 BASIC "MOV   @#A,-(R)" TEST
5680                                    ; ***************************************************************************
5681
5682                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5683
5684                                    ;ROM SEQ:       [143,245,246,247,250,174,200,125,375,016] FC 1,2,4
5685
5686                                    ;ACT BUTS:      37[004]100,143 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016
5687
5688                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA
5689
5690                                    ;CODES:         [125] SPS=3  /  N:C=0100
5691
5692                                    ;SYNC:          BOSJ2 (-)       /       T= 4.2 USEC
5693
5694                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=4L  /  K5-2 PS(Z)(1)H
5695
5696  006014  012700  000054            TD054:  MOV     #0054,R0                ;LOAD R0 WITH TEST NO.
5697  006020  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5698  006026  012704  067612                    MOV     #DWTA,R4        ;RESULT S / B = #DWTA
5699  006032  012702  067602                    MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
5700  006036  012705  067604            R0054:  MOV     #MBUF0+2,R5     ;INITIAL DEST ADDR = MBUF0+2
5701  006042  005012                            CLR     (R2)            ;MAKE [DEST] = 000000
5702  006044  000257                            CCC                     ;SCOPE SYNC
5703
5704  006046  013745  067566            I0054:  MOV     @#ATA,-(R5)     ;TEST THE MOV
5705
5706  006052  020412                            CMP     R4,(R2)         ;RESULT = 000000
5707  006054  001403                            BEQ     A0054           ;BR IF YES
5708
5709  006056  011203                            MOV     (R2),R3         ;GET THE WAS DATA
5710  006060  000000            E10054:  HALT                           ;MOV DELIVERED THE WRONG RESULT
5711  006062  000765                     BR      R0054           ;LOCK ON HARD ERROR
5712
5713  006064  020502            A0054:  CMP     R5,R2           ;DID DEST REG GET DECREMENTED ??
5714  006066  001402                    BEQ     T0055           ;BR IF YES
5715
5716  006070  000000            E20054:  HALT                           ;MOV FAILED TO UPDATE REGISTER
5717  006072  000761                     BR      R0054           ;LOCK ON HARD ERROR
5718
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0055 BASIC "MOV  (R),@#A" TEST
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [141,247,250,173,210,200,125,375,016]  FC 1,2,4
                                ;
                                ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016
                                ;
                                ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA
                                ;
                                ;CODES:         [125] SPS=3  /  N:C=0100
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 4 USEC
                                ;
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=1L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
                                ;
006074  012700  000055          T0055:  MOV     #0055,R0                ;LOAD R0 WITH TEST NO.
006100  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006106  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006112  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
006116  012705  067566                  MOV     #ATA,R5         ;SOURCE ADDR = ATA
006122  005012                  R0055:  CLR     (R2)            ;MAKE [DEST] = 000000
006124  000257                          CCC                     ;SCOPE SYNC
                                ;
006126  011537  067602          I0055:  MOV     (R5),@#MBUF0    ;TEST THE MOV
                                ;
006132  020412                          CMP     R4,(R2)         ;RESULT = #DWTA ??
006134  001403                          BEQ     T0056           ;BR IF YES
                                ;
006136  011203                          MOV     (R2),R3         ;GET THE WAS DATA
006140  000000                  E0055:  HALT                    ;MOV DELIVERED THE WRONG RESULT
006142  000767                          BR      R0055           ;LOCK ON HARD ERROR
                                ;
```

```
5754                                    ; ***************************************************************************
5755                                    .SBTTL T0056 BASIC "MOV  -(R),@#A" TEST
5756                                    ; ***************************************************************************
5757
5758                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5759
5760                                    ;ROM SEQ:       [144,240,250,173,207,210,200,125,375,016] FC 1,2,4
5761
5762                                    ;ACT BUTS:      37[004]100,144 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016
5763
5764                                    ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA
5765
5766                                    ;CODES:         [125] SPS=3  /  N:C=0100
5767
5768                                    ;SYNC:          BOSJ2 (-)       /       T= 4 USEC
5769
5770                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=4L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
5771
5772  006144  012700  000056           T0056:  MOV     #0056,R0                ;LOAD R0 WITH TEST NO.
5773  006150  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5774  006156  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
5775  006162  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
5776  006166  012705  067570           R0056:  MOV     #ATA+2,R5       ;INITIAL SOURCE ADDR = ATA+2
5777  006172  005012                           CLR     (R2)            ;MAKE [DEST] = 000000
5778  006174  000257                           CCC                     ;SCOPE SYNC
5779
5780  006176  014537  067602           I0056:  MOV     -(R5),@#MBUF0   ;TEST THE MOV
5781
5782  006202  020412                           CMP     R4,(R2)         ;RESULT = #DWTA ?
5783  006204  001403                           BEQ     A0056           ;BR IF YES
5784
5785  006206  011203                           MOV     (R2),R3         ;GET THE WAS DATA
5786  006210  000000           E10056: HALT                            ;MOV DELIVERED THE WRONG RESULT
5787  006212  000765                           BR      R0056           ;LOCK ON HARD ERROR
5788
5789  006214  022705  067566   A0056:  CMP     #ATA,R5         ;DID THE SRC REG GET DECREMENTED ?
5790  006220  001402                           BEQ     T0057           ;BR IF YES
5791
5792  006222  000000           E20056: HALT                            ;MOV FAILED TO UPDATE SOURCE REG
5793  006224  000760                           BR      R0056           ;LOCK ON HARD ERROR
```

```
5794                                    ; ***************************************************************************
5795                                          .SBTTL T0057 BASIC "MOV   (RA),RB" TEST
5796                                    ; ***************************************************************************
5797
5798                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5799
5800                                    ;ROM SEQ:       [142,240,250,160,204,000] FC 1,2,4
5801
5802                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,000
5803
5804                                    ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA
5805
5806                                    ;CODES:         [204] SPS=3  /  N:C=0100
5807
5808                                    ;SYNC:          B05J2 (-)       /       T= 1.8 USEC
5809
5810                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=2L  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H
5811
5812  006226  012700  000057           T0057:  MOV     #0057,R0                ;LOAD R0 WITH TEST NO.
5813  006232  112760  000377  070162           MOVB    #377,$TAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5814  006240  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
5815  006244  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
5816  006250  012705  067566           R0057:  MOV     #ATA,R5         ;INITIAL SOURCE ADDR = ATA
5817  006254  005003                           CLR     R3              ;MAKE [DEST] = 000000
5818  006256  000257                           CCC                     ;SCOPE SYNC
5819
5820  006260  012503                   I0057:  MOV     (R5)+,R3        ;TEST THE MOV
5821
5822  006262  020403                           CMP     R4,R3           ;RESULT = #DWTA ?
5823  006264  001402                           BEQ     A0057           ;BR IF YES
5824
5825  006266  000000                   E10057: HALT                    ;MOV DELIVERED WRONG RESULT
5826  006270  000767                           BR      R0057           ;LOCK ON HARD ERROR
5827
5828  006272  022705  067570           A0057:  CMP     #ATA+2,R5       ;DID SOURCE REG GET INCREMENTED
5829  006276  001402                           BEQ     T0060           ;BR IF YES
5830
5831  006300  000000                   E20057: HALT                    ;MOV FAILED TO UPDATE SOURCE REGISTER
5832  006302  000762                           BR      R0057           ;LOCK ON HARD ERROR
5833
```

```
5834                                    ; ************************************************************************
5835                                    .SBTTL T0060 BASIC "MOV   X(RA),RB" TEST
5836                                    ; ************************************************************************
5837
5838                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
5839
5840                                    ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4
5841
5842                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000
5843
5844                                    ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTB
5845
5846                                    ;CODES:         [204] SPS=3  /  N:C=0100
5847
5848                                    ;SYNC:          B05J2 (-)       /       T= 2.5 USEC
5849
5850                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H
5851
5852  006304  012700  000060           T0060:  MOV     #0060,R0                ;LOAD R0 WITH TEST NO.
5853  006310  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
5854  006316  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
5855  006322  012704  070136                   MOV     #DWTB,R4        ;RESULT S / B = #DWTB
5856  006326  012705  067566                   MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
5857  006332  005003                   R0060:  CLR     R3              ;MAKE [DEST] = 000000
5858  006334  000257                           CCC                     ;SCOPE SYNC
5859
5860  006336  016503  000002           I0060:  MOV     2(R5),R3        ;TEST THE MOV
5861
5862  006342  020403                           CMP     R4,R3           ;RESULT = #DWTB ?
5863  006344  001402                           BEQ     T0061           ;BR IF YES
5864
5865  006346  000000                   E0060:  HALT                    ;MOV FAILED TO DELIVER CORRECT RESULT
5866  006350  000770                           BR      R0060           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************
                                        .SBTTL T0061 BASIC "MOV   @X(RA),RB" TEST
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [147,243,244,245,246,247,250,160,204,000] FC 1,2,4
                                ;
                                ;ACT BUTS:      37[004]100,147 / 35[247]120,160 / 20[160]000,000
                                ;
                                ;EXEC:          [160]ALUC=LLLLL :[204]D=177777
                                ;
                                ;CODES:         [204] SPS=3  /  N:C=1000
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 3.4 USEC
                                ;
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=7L  /  K3-3 DM=0L  /  K5-2 PS(N)(1)H
                                ;
006352  012700  000061        T0061:  MOV     #0061,R0                ;LOAD R0 WITH TEST NO.
006356  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006364  005004                        CLR     R4              ;RESULT S / B = 177777
006366  005104                        COM     R4
006370  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
006374  012737  067614  067604        MOV     #DWTA+2,@#MBUF0+2 ;SET UP ADDRESS TABLE MBUF0
006402  012705  067602                MOV     #MBUF0,R5       ;BASE ADDRESS IN R5
006406  005003                R0061:  CLR     R3              ;MAKE [DEST] = 000000
006410  000257                        CCC                     ;SCOPE SYNC
                                ;
006412  017503  000002        I0061:  MOV     @2(R5),R3       ;TEST THE MOV
                                ;
006416  020403                        CMP     R4,R3           ;RESULT = 177777
006420  001402                        BEQ     T0062           ;BR IF YES
                                ;
006422  000000                E0061:  HALT                    ;MOV DELIVERED THE WRONG RESULT
006424  000770                        BR      R0061           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL T0062 BASIC "MOV  (R)+,X(R)" TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
                                                ; / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=125252

                                ;CODES:         [125] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=2L  /  K3-3 DM=6L  /  K5-2 PS(N)(1)H

006426  012700  000062        T0062:  MOV     #0062,R0                ;LOAD R0 WITH TEST NO.
006432  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006440  012704  125252                MOV     #125252,R4      ;RESULT S / B = 125252
006444  012702  067610                MOV     #MBUF1+2,R2     ;FINAL DEST ADDR = MBUF1+2
006450  010437  067602                MOV     R4,@#MBUF0      ;SOURCE OPERAND = 125252
006454  012705  067602        R0062:  MOV     #MBUF0,R5       ;[R5] = INITIAL SRC ADDR = MBUF0
006460  005012                        CLR     (R2)            ;MAKE [DEST] = 000000
006462  000257                        CCC                     ;SCOPE SYNC

006464  012565  000004        I0062:  MOV     (R5)+,4(R5)     ;TEST THE MOV

006470  020412                        CMP     R4,(R2)         ;RESULT = 125252 ?
006472  001403                        BEQ     A0062           ;BR IF YES

006474  011203                        MOV     (R2),R3         ;GET THE WAS DATA
006476  000000                E10062: HALT                    ;MOV    DELIVERED WRONG RESULT
006500  000765                        BR      R0062           ;LOCK ON HARD ERROR

006502  022705  067604        A0062:  CMP     #MBUF0+2,R5     ;DID REGISTER GET INCREMENTED ?
006506  001402                        BEQ     T0063           ;BR IF YES

006510  000000                E20062: HALT                    ;MOV FAILED TO UPDATE REGISTER
006512  000760                        BR      R0062           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************
                                        .SBTTL T0063 BASIC "CMP  R,@#A" TEST WITH [R] = [A]
                                ; ***************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [163,264,265,266,267,224,367,375,016] FC 1,3,8
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,224 / 16[367]016,016
                                ;EXEC:          [224]ALUC=LLHHL :[367]D=125252
                                ;CODES:         [367] SPS=3  /  N:C=1100
                                ;SYNC:          B05J2 (-)       /       T= 3.5 USEC
                                ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
                                ;  K3-8 BTI + CMP + TST H
006514  012700  000063        T0063:  MOV     #0063,R0                ;LOAD R0 WITH TEST NO.
006520  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006526  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006532  012704  125252                MOV     #125252,R4      ;RESULT S / B = 125252
006536  010405                R0063:  MOV     R4,R5           ;[R5] = SOURCE OP = 125252
006540  010412                        MOV     R4,(R2)         ;MAKE [DEST] = 125252
006542  000257                        CCC                     ;SCOPE SYNC
006544  020537  067602        I0063:  CMP     R5,@#MBUF0      ;TEST THE CMP
006550  001402                        BEQ     A0063           ;BR IF "Z" WAS SET - IT SHOULD BE
006552  000000                E10063: HALT                    ;CMP FAILED TO SET "Z"
006554  000770                        BR      R0063           ;LOCK ON HARD ERROR
006556  020412                A0063:  CMP     R4,(R2)         ;IS RESULT STILL = 125252 ?
006560  001403                        BEQ     T0064           ;BR IF YES
006562  011203                        MOV     (R2),R3         ;GET THE WAS DATA
006564  000000                E20063: HALT                    ;CMP ALTERED [DEST]
006566  000763                        BR      R0063           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                        .SBTTL T0064 BASIC "CMP  R,@#A" WITH [R] NOT EQUAL TO [A]
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [163,264,266,267,224,367,375,016] FC 1,3,8
                                ;ACT BUTS:      37[004]100,163 / 33[266]220,224 / 16[367]016,016
                                ;EXEC:          [224]ALUC=LLHHL :[367]D=052526
                                ;CODES:         [367] SPS=3  /  N:C=1000
                                ;SYNC:          BOSJ2 (-)       /       T= 3.5 USEC
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=0L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH
006570  012700  000064        T0064:  MOV     #0064,R0                ;LOAD R0 WITH TEST NO.
006574  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006602  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006606  012704  125252                MOV     #125252,R4      ;MAKE RESULT S / B = 125252
006612  005005                R0064:  CLR     R5              ;[R5] = SOURCE OP = 000000
006614  010412                        MOV     R4,(R2)         ;MAKE [DEST] = 125252
006616  000277                        SCC                     ;SCOPE SYNC - MAKE Z=1
006620  020537  067602        I0064:  CMP     R5,@#MBUF0      ;TEST THE CMP
006624  001002                        BNE     T0065           ;BR IF Z=0 - IT SHOULD BE
006626  000000                E0064:  HALT                    ;CMP FAILED TO CLEAR "Z"
006630  000770                        BR      R0064           ;LOCK ON HARD ERROR
```

```
6020                                    ;*****************************************************************
6021                                    ;       .SBTTL T0065 BASIC "CMP  #N,@#A" TEST WITH [A] = N
6022                                    ; *****************************************************************
6023
6024                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6025
6026                                    ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
6027
6028                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
6029
6030                                    ;EXEC:          [225]ALUC=LLHHL :[367]D=000000
6031
6032                                    ;CODES:         [367] SPS=3  /  N:C=0100
6033
6034                                    ;SYNC:          BOSJ2 (-)       /       T= 4.3 USEC
6035
6036                                    ;KEY SIG:       K3-3 CMPL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
6037                                                    ;  K3-8 BIT+CMP+TSTH
6038
6039  006632  012700  000065           T0065:  MOV     #0065,R0                ;LOAD R0 WITH TEST NO.
6040  006636  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6041  006644  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
6042  006650  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
6043  006654  010412                   R0065:  MOV     R4,(R2)         ;MAKE [DEST] = 125252
6044  006656  000257                           CCC                     ;SCOPE SYNC - Z=0
6045
6046  006660  022737  125252  067602   I0065:  CMP     #125252,@#MBUF0 ;TEST THE CMP
6047
6048  006666  001402                           BEQ     T0066           ;BR IF Z=1 - IT SHOULD BE
6049
6050  006670  000000                   E0065:  HALT                    ;CMP FAILED TO SET "Z"
6051  006672  000770                           BR      R0065           ;LOCK ON HARD ERROR
6052
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0066 BASIC "CMP  #N,@#A" TEST WITH [A] NOT EQUAL TO #N
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
                                ;
                                ;EXEC:          [225]ALUC=LLHHL :[367]D=125252
                                ;
                                ;CODES:         [367] SPS=3  /  N:C=1000
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 4.3 USEC
                                ;
                                ;KEY SIG:       K3-3 CMPL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H
                                ;                ;  K3-8 BIT+CMP+TSTH
                                ;
006674  012700  000066          T0066:  MOV     #0066,R0                ;LOAD R0 WITH TEST NO.
006700  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006706  012704  125252                  MOV     #125252,R4      ;RESULT S / B=125252
006712  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006716  005012                  R0066:  CLR     (R2)            ;MAKE [DEST] = 000000
006720  000277                          SCC                     ;SCOPE SYNC - Z=1
                                ;
006722  022737  125252  067602  I0066:  CMP     #125252,@#MBUF0 ;TEST THE CMP
                                ;
006730  001002                          BNE     T0067           ;BR IF Z=0 - IT SHOULD BE
                                ;
006732  000000                  E0066:  HALT                    ;CMP FAILED TO CLEAR "Z"
006734  000770                          BR      R0066           ;LOCK ON HARD ERROR
                                ;
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL TQQ67 BASIC "BIS #N,@#A" TEST - N=177777,[A]=000000
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,3,8
                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
                                        ;EXEC:          [225]ALUC LLLLH :[367]D=177777
                                        ;CODES:         [367] SPS=3  /  N:C=1000
                                        ;SYNC:          BOSJ2 (-)       /       T= 4.3 USEC
                                        ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=3L  /  K3-3 BIS L
006736  012700  000067          TQQ67:  MOV     #QQ67,R0                ;LOAD R0 WITH TEST NO.
006742  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006750  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006754  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
006760  005012                  RQQ67:  CLR     (R2)            ;[DEST] = 000000
006762  000257                          CCC                     ;SCOPE SYNC

006764  052737  177777  067602  IQQ67:  BIS     #-1,@#MBUF0     ;TEST THE BIS

006772  020412                          CMP     R4,(R2)         ;RESULT OK?
006774  001403                          BEQ     TQQ70           ;BR IF YES

006776  011203                          MOV     (R2),R3         ;GET WAS DATA
007000  000000                  EQQ67:  HALT                    ;BIS FAILED TO SET ALL BITS IN BITFLG
007002  000766                          BR      RQQ67           ;LOCK ON HARD ERROR
```

```
.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 162
DBQEAB.CMB      T0067 BASIC "BIS #N,@#A" TEST - N=177777,[A]=000000

                                        ; ************************************************************************
                                        ;       .SBTTL T0070 BASIC "BIC  #N,@#A" TEST
                                        ; ************************************************************************
                                        ;
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;
                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
                                        ;
                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
                                        ;
                                        ;EXEC:          [225]ALUC=HLLHL :[367]D=000077
                                        ;
                                        ;CODES:         [367] SPS=3  /  N:C=0000
                                        ;
                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC
                                        ;
                                        ;KEY SIG:       K3-3 BICL  /  K3-3 SM=2L  /  K3-3 DM=3L
                                        ;
007004  012700  000070          T0070:  MOV     #0070,R0                ;LOAD R0 WITH TEST NO.
007010  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007016  012702  067602                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
007022  012704  000077                 MOV     #77,R4          ;RESULT S / B = 77
007026  012712  177777          R0070:  MOV     #-1,(R2)        ;MAKE [DEST] = 177777
007032  000257                         CCC                     ;SCOPE SYNC
                                        ;
007034  042737  177700  067602  I0070:  BIC     #177700,@#MBUF0 ;TEST THE BIC
                                        ;
007042  020412                         CMP     R4,(R2)         ;DID RESULT = 77 ?
007044  001403                         BEQ     T0071           ;BR IF YES
                                        ;
007046  011203                         MOV     (R2),R3         ;GET THE WAS DATA
007050  000000                 E0070:  HALT                    ;BIC DELIVERED THE WRONG RESULT
007052  000765                         BR      R0070           ;LOCK ON HARD ERROR
                                        ;
```

```
6154                                    ; ***************************************************************************
6155                                    .SBTTL T0071 BASIC "BIC #N,R" TEST
6156                                    ; ***************************************************************************
6157
6158                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6159
6160                                    ;ROM SEQ:       [142,240,250,120,371,360,000] FC 1,2,8
6161
6162                                    ;ACT BUTS:      35[240]120,120 / 31[120]360,360 / 27[371]000,000
6163
6164                                    ;EXEC:          [371]ALUC MLLHL :[360]D=377
6165
6166                                    ;CODES:         [360] SPS=3  /  N:C=0000
6167
6168                                    ;SYNC:          B05J2 (-)       /       T= 4.3 USEC
6169
6170                                    ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=0L  /  K3-3 BIC L
6171
6172  007054  012700  000071           T0071:  MOV     #0071,R0                ;LOAD R0 WITH TEST NO.
6173  007060  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6174  007066  012704  000377                   MOV     #377,R4         ;RESULT S / B = 377
6175  007072  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
6176  007076  005003                   R0071:  CLR     R3              ;[DEST] = 177777
6177  007100  005103                           COM     R3
6178  007102  000257                           CCC                     ;SCOPE SYNC
6179
6180  007104  042703  177400           I0071:  BIC     #177400,R3      ;TEST THE BIC
6181
6182  007110  020304                           CMP     R3,R4           ;RESULT OK?
6183  007112  001402                           BEQ     T0072           ;BR IF YES
6184
6185  007114  000000                   E0071:  HALT                    ;BIC FAILED TO CLEAR HI-BYTE
6186  007116  000767                           BR      R0071           ;LOCK ON HARD ERROR
6187
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0072 BASIC "BIC #N,2(SP)" TEST
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[250]120,167 / 17[167]262,262 / 33[266]220,225
                                ;                / 16[367]016,016
                                ;
                                ;EXEC:          [225]ALUC HLLHL :[367]D=357
                                ;
                                ;CODES:         [367] SPS=3  /  N:C=0000
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 3.3 USEC
                                ;
                                ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=6  /  K3-3 BIC L
                                ;
007120  012700  000072          T0072:  MOV     #0072,R0                ;LOAD R0 WITH TEST NO.
007124  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007132  012704  000357                  MOV     #357,R4         ;RESULT S / B = 357
007136  010605                          MOV     SP,R5           ;SAVE SP
007140  010506                  R0072:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
007142  012746  000377                  MOV     #377,-(SP)      ;[DEST] = 377 PUT ON STACK
007146  005746                          TST     -(SP)           ;DECREMENT SP
007150  000257                          CCC                     ;SCOPE SYNC
                                ;
007152  042766  000020  000002  I0072:  BIC     #20,2(SP)       ;TEST THE BIC - CLEAR BIT 4
                                ;
007160  010602                          MOV     SP,R2           ;[R2] = DEST ADDR
007162  005722                          TST     (R2)+
007164  020412                          CMP     R4,(R2)         ;RESULT = 357?
007166  001403                          BEQ     A0072           ;BR IF YES
                                ;
007170  011203                          MOV     (R2),R3         ;GET WAS DATA
007172  000000                  E0072:  HALT                    ;BIC FAILED TO CLR BIT2 OF DEST
007174  000761                          BR      R0072           ;LOCK ON HARD ERROR
                                ;
007176  010506                  A0072:  MOV     R5,SP
                                ;
```

```
6229                                    ; ***************************************************************************
6230                                            .SBTTL T0073 BASIC "BIT  #N,@#A" WITH BIT SET IN "A"
6231                                    ; ***************************************************************************
6232
6233                                    ;MICRO PROGRAMMING  /  LOGIC INFORMATION
6234
6235                                    ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
6236
6237                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
6238
6239                                    ;EXEC:          [225]ALUC=HHLHH :[367]D=040000
6240
6241                                    ;CODES:         [367] SPS=3  /  N:C=0000
6242
6243                                    ;SYNC:          B05J2 (-)       /       T= 4.3 USEC
6244
6245                                    ;KEY SIG:       K3-3 BITL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH
6246
6247  007200  012700  000073           T0073:  MOV     #0073,R0                ;LOAD R0 WITH TEST NO.
6248  007204  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6249  007212  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
6250  007216  012704  040000                   MOV     #40000,R4       ;RESULT S / B = 40000
6251  007222  010412                   R0073:  MOV     R4,(R2)         ;MAKE [DEST] = 40000
6252  007224  000277                           SCC                     ;SCOPE SYNC - Z=1
6253
6254  007226  032737  040000  067602 I0073:  BIT     #40000,@#MBUF0  ;TEST THE BIT
6255
6256  007234  001002                           BNE     T0074           ;BR IF Z=0 - IT SHOULD BE
6257
6258  007236  000000                   E0073:  HALT                    ;BIT FAILED TO CLEAR "Z"
6259  007240  000770                           BR      R0073           ;LOCK ON HARD ERROR
6260
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0074 BASIC "BIT  #N,@#A" WITH BIT CLEAR IN "A"
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
                                ;
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
                                ;
                                ;EXEC:          [225]ALUC=HHLHH :[367]D=000000
                                ;
                                ;CODES:         [367] SPS=3  /  M:C=0100
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 4.3 USEC
                                ;
                                ;KEY SIG:       K3-3 BITL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH
                                ;  K5-2 PS(Z)(1)H
                                ;
007242  012700  000074        T0074:  MOV     #0074,R0                ;LOAD R0 WITH TEST NO.
007246  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007254  012702  067602                MOV     #MBUF0,R2               ;DEST ADDR = MBUF0
007260  005004                       CLR     R4                      ;RESULT S / B = 000000
007262  005012                R0074:  CLR     (R2)                    ;MAKE [DEST] = 000000
007264  000257                        CCC                             ;SCOPE SYNC - Z=0
                                ;
007266  032737  040000  067602 I0074:  BIT     #40000,@#MBUF0  ;TEST THE BIT
                                ;
007274  001402                        BEQ     A0074                   ;BR IF Z=1 - IT SHOULD BE
                                ;
007276  000000                E10074: HALT                            ;BIT FAILED TO SET "Z"
007300  000770                        BR      R0074                   ;LOCK ON HARD ERROR
                                ;
007302  020412                A0074:  CMP     R4,(R2)                 ;DID BIT DELIVER A RESULT
007304  001403                        BEQ     T0075                   ;BR IF NOT
                                ;
007306  011203                        MOV     (R2),R3                 ;GET THE WAS DATA
007310  000000                E20074: HALT                            ;BIT DISTURBED THE [DEST]
007312  000763                        BR      R0074                   ;LOCK ON HARD ERROR
                                ;
```

```
6301                                    ; ***************************************************************************
6302                                    .SBTTL T0075 BASIC "ADD  #N,(R) " TEST
6303                                    ; ***************************************************************************
6304
6305                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6306
6307                                    ;ROM SEQ:       [142,240,250,161,266,267,225,367,375,016] FC 1,2,3,8
6308
6309                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,161 / 33[266]220,225 / 16[367]016,016
6310
6311                                    ;EXEC:          [225]ALUC=LHLLH :[367]D=000004
6312
6313                                    ;CODES:         [367] SPS=3  /  N:C=0000
6314
6315                                    ;SYNC:          BOSJ2 (-)       /       T=3.4 USEC
6316
6317                                    ;KEY SIG:       K3-3 ADD+SUBL  /  K3-3 SM=2L  /  K3-3 DM=1L
6318
6319  007314  012700  000075            T0075:  MOV     #0075,R0                ;LOAD R0 WITH TEST NO.
6320  007320  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6321  007326  012702  067602                    MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
6322  007332  012704  000004                    MOV     #4,R4           ;RESULT S / B = 4
6323  007336  012712  000002            R0075:  MOV     #2,(R2)         ;MAKE [DEST] = 2
6324  007342  000257                            CCC                     ;SCOPE SYNC
6325
6326  007344  062712  000002            I0075:  ADD     #2,(R2) ;TEST THE ADD
6327
6328  007350  020412                            CMP     R4,(R2)         ;RESULT = 4 ?
6329  007352  001403                            BEQ     T0076           ;BR IF YES
6330
6331  007354  011203                            MOV     (R2),R3         ;GET THE WAS DATA
6332  007356  000000            E0075:  HALT                            ;ADD DELIVERED THE WRONG RESULT
6333  007360  000766                            BR      R0075           ;LOCK ON HARD ERROR
6334
```

```
                                ; ************************************************************************
                                        .SBTTL T0076 BASIC "ADD  #N,X(R)" TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,262 / 33[266]220,225
                                ; / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367]D=000004

                                ;CODES:         [367] SPS=3  /  N:C=0000

                                ;SYNC:          B05J2 (-)       /       T= 3.4 USEC

                                ;KEY SIG:       K3-3 ADD+SUBL  /  K3-3 SM=2L  /  K3-3 DM=6L

007362  012700  000076        T0076:  MOV     #0076,R0                ;LOAD R0 WITH TEST NO.
007366  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007374  012704  000002                MOV     #2,R4           ;RESULT S / B = 4
007400  012702  067604                MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0 + 2
007404  012705  067602        R0076:  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
007410  005012                        CLR     (R2)            ;MAKE [DEST] = 000000
007412  000257                        CCC                     ;SCOPE SYNC

007414  062765  000002  000002  I0076:  ADD     #2,2(R5)        ;TEST THE ADD

007422  020412                        CMP     R4,(R2)         ;RESULT = 4 ?
007424  001403                        BEQ     T0077           ;BR IF YES

007426  011203                        MOV     (R2),R3         ;GET THE WAS DATA
007430  000000                E0076:  HALT                    ;ADD DELIVERED THE WRONG RESULT
007432  000764                        BR      R0076           ;LOOP ON HARD ERROR
```

```
6372                                    ; ************************************************************************
6373                                            .SBTTL T0077 BASIC "CMPB #N,(SP)+" TEST
6374                                    ; ************************************************************************
6375
6376                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6377
6378                                    ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8
6379
6380                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016
6381
6382                                    ;EXEC:          [225]ALUC=LLHHL :[367]D=177400
6383
6384                                    ;CODES:         [367] SPS=3  /  N:C=0100
6385
6386                                    ;SYNC:          B05J2 (-)       /       T= 4 USEC
6387
6388                                    ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H
6389
6390  007434  012700  000077           T0077:  MOV     #0077,R0                ;LOAD R0 WITH TEST NO.
6391  007440  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6392  007446  032737  000002  066642           BIT     #2,@#BPTLOC     ;BREAKPOINT HALT SET ??
6393  007454  001401                           BEQ     .+4             ;BR IF NOT
6394  007456  000000                           HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
6395  007460  012704  177400                   MOV     #177400,R4      ;RESULT S / B = 177400
6396  007464  010605                           MOV     SP,R5           ;SAVE SP
6397  007466  010602                           MOV     SP,R2           ;SET UP DEST ADDR
6398  007470  005742                           TST     -(R2)           ;R2 CONTAINS DEST ADDR
6399  007472  010506                   R0077:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
6400  007474  010446                           MOV     R4,-(SP)        ;MAKE [DEST] = 177400
6401  007476  000257                           CCC                     ;SCOPE SYNC - "Z" = 0
6402
6403  007500  122726  000000           I0077:  CMPB    #0,(SP)+        ;TEST THE CMPB
6404
6405  007504  001403                           BEQ     A0077           ;BR IF "Z" SET - IT SHOULD BE
6406
6407  007506  011203                           MOV     (R2),R3         ;GET WAS DATA
6408  007510  000000                   E10077: HALT                    ;CMPB FAILED TO SET "Z"
6409  007512  000767                           BR      R0077           ;LOCK ON HARD ERROR
6410
6411  007514  020506                   A0077:  CMP     R5,SP           ;DID SP GET UPDATED BY 2?
6412  007516  001402                           BEQ     B0077           ;BR IF YES
6413
6414  007520  000000                   E20077: HALT                    ;CMPB FAILED TO UPDATE SP PROPERLY
6415  007522  000763                           BR      R0077           ;LOCK ON HARD ERROR
6416
6417  007524  020412                   B0077:  CMP     R4,(R2)         ;[DEST] ALTERED?
6418  007526  001403                           BEQ     T0100           ;BR IF NOT
6419
6420  007530  011203                           MOV     (R2),R3         ;GET WAS DATA
6421  007532  000000                   E30077: HALT                    ;CMPB MODIFIED [DEST]
6422  007534  000756                           BR      R0077           ;LOCK ON HARD ERROR.
6423
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0100 BASIC "CMPB (RA)+,(RB)+" - SRC AND DEST EVEN
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8
                                ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016
                                ;EXEC:          [225]ALUC=LLHHL :[326]D=177400
                                ;CODES:         [367] SPS=3  /  N:C=0100
                                ;SYNC:          B05J2 (-)       /       T= 4.5 USEC
                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H
007536  012700  000100          T0100:  MOV     #0100,R0                ;LOAD R0 WITH TEST NO.
007542  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007550  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
007554  012702  067614                  MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
007560  012705  067620          R0100:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
007564  010203                  MOV     R2,R3           ;R3 GETS DEST ADDR
007566  000257                  CCC                     ;SCOPE SYNC

007570  122523          I0100:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

007572  001402                  BEQ     A0100           ;BR IF "Z" = 1 - IT SHOULD BE

007574  000000          E10100: HALT                    ;CMPB FAILED TO SET "Z"
007576  000770                  BR      R0100           ;LOCK ON HARD ERROR

007600  022703  067615  A0100:  CMP     #DWTA+3,R3      ;DID DEST REG GET UPDATED?
007604  001402                  BEQ     B0100           ;BR IF YES

007606  000000          E20100: HALT                    ;CMPB FAILED TO UPDATE DEST REG
007610  000763                  BR      R0100           ;LOCK ON HARD ERROR

007612  022705  067621  B0100:  CMP     #DWTA+7,R5      ;DID SRC REG GET UPDATED?
007616  001402                  BEQ     C0100           ;BR IF YES

007620  000000          E30100: HALT                    ;CMPB FAILED TO UPDATE SRC REG
007622  000756                  BR      R0100           ;LOCK ON HARD ERROR

007624  020412          C0100:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
007626  001404                  BEQ     T0101           ;BR IF NOT

007630  011203                  MOV     (R2),R3         ;GET WAS DATA
007632  000000          E40100: HALT                    ;CMPB DELIVERED A RESULT
007634  010412                  MOV     R4,(R2)         ;RESTORE [DEST]
007636  000750                  BR      R0100           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0101 BASIC "CMPB (RA)+,(RB)+" - SRC AND DEST ODD
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,137,251,162,260,267,237,270,231,254,074,366,375,016] FC 1,2

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,162 / 33[260]220,237
                                ; / 34[237]220,231 / 16[366]016,016

                                ;EXEC:          [231]ALUC=LLHHL :[254]D=000000

                                ;CODES:         [074] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)       /       T= 4.5 USEC

                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H

007640  012700  000101         T0101:  MOV     #0101,R0                ;LOAD R0 WITH TEST NO.
007644  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007652  012704  177777                 MOV     #-1,R4          ;RESULT S / B = 177777
007656  012702  067614                 MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
007662  012705  067617         R0101:  MOV     #DWTA+5,R5      ;SRC ADDR = DWTA+5
007666  012703  067615                 MOV     #DWTA+3,R3      ;R3 GETS DEST ADDR+1
007672  000257                         CCC                     ;SCOPE SYNC

007674  122523                 I0101:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

007676  001402                         BEQ     A0101           ;BR IF "Z" = 1 - IT SHOULD BE

007700  000000                 E10101: HALT                    ;CMPB FAILED TO SET "Z"
007702  000767                         BR      R0101           ;LOCK ON HARD ERROR

007704  022703  067616         A0101:  CMP     #DWTA+4,R3      ;DID DEST REG GET UPDATED?
007710  001402                         BEQ     B0101           ;BR IF YES

007712  000000                 E20101: HALT                    ;CMPB FAILED TO UPDATE DEST REG
007714  000762                         BR      R0101           ;LOCK ON HARD ERROR

007716  022705  067620         B0101:  CMP     #DWTA+6,R5      ;DID SRC REG GET UPDATED?
007722  001402                         BEQ     C0101           ;BR IF YES

007724  000000                 E30101: HALT                    ;CMPB FAILED TO UPDATE SRC REG
007726  000755                         BR      R0101           ;LOCK ON HARD ERROR

007730  020412                 C0101:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
007732  001404                         BEQ     T0102           ;BR IF NOT

007734  011203                         MOV     (R2),R3         ;GET WAS DATA
007736  000000                 E40101: HALT                    ;CMPB DELIVERED A RESULT
007740  010412                         MOV     R4,(R2)         ;RESTORE [DEST]
007742  000747                         BR      R0101           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0102 BASIC "CMPB (RA)+,(RB)+" - SRC / EVEN,DEST / ODD
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,162,260,267,237,270,231,254,074,366,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 36[240]120,162 / 33[260]220,237 / 34[237]220,231
                                ; / 16[366]016,016

                                ;EXEC:          [231]ALUC=LLHHL :[367]D=000400

                                ;CODES:         [074] SPS=8  /  N:C=0100

                                ;SYNC:          BOSJ2 (-)  /  /       T= 4.5 USEC

                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2  /  K3-6 BYTE INSTR H

007744  012700  000102         T0102:  MOV     #0102,R0                ;LOAD R0 WITH TEST NO.
007750  112760  000377  070162          MOVB    #377,$TAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007756  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
007762  012702  067616                  MOV     #DWTA+4,R2      ;DEST ADDR = DWTA+4
007766  012705  067620          R0102:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
007772  012703  067617                  MOV     #DWTA+5,R3      ;R3 GETS DEST ADDR
007776  000257                          CCC                     ;SCOPE SYNC

010000  122523                  I0102:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

010002  001402                          BEQ     A0102           ;BR IF "Z" = 1 - IT SHOULD BE

010004  000000                  E10102: HALT                    ;CMPB FAILED TO SET "Z"
010006  000767                          BR      R0102           ;LOCK ON HARD ERROR

010010  022703  067620          A0102:  CMP     #DWTA+6,R3      ;DID DEST REG GET UPDATED?
010014  001402                          BEQ     B0102           ;BR IF YES

010016  000000                  E20102: HALT                    ;CMPB FAILED TO UPDATE DEST REG
010020  000762                          BR      R0102           ;LOCK ON HARD ERROR

010022  022705  067621          B0102:  CMP     #DWTA+7,R5      ;DID SRC REG GET UPDATED?
010026  001402                          BEQ     C0102           ;BR IF YES

010030  000000                  E30102: HALT                    ;CMPB FAILED TO UPDATE SRC REG
010032  000755                          BR      R0102           ;LOCK ON HARD ERROR

010034  020412                  C0102:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
010036  001404                          BEQ     T0103           ;BR IF NOT

010040  011203                          MOV     (R2),R3         ;GET WAS DATA
010042  000000                  E40102: HALT                    ;CMPB DELIVERED A RESULT
010044  010412                          MOV     R4,(R2)         ;RESTORE [DEST]
010046  000747                          BR      R0102           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL TD103 BASIC "CMPB (RA)+,(RB)+" - SRC / ODD,DEST / EVEN
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,162 / 33[260]220,225
                                        ; / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          BOSJ2 (-)       /       T= 4.5 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2  /  K3-6 BYTE INSTR H

010050  012700  000103         TD103:  MOV     #0103,R0                ;LOAD R0 WITH TEST NO.
010054  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010062  012704  177777                 MOV     #-1,R4          ;RESULT S / B = 177777
010066  012702  067614                 MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
010072  012705  067617         RD103:  MOV     #DWTA+5,R5      ;SRC ADDR = DWTA+5
010076  010203                         MOV     R2,R3           ;R3 GETS DEST ADDR
010100  000257                         CCC                     ;SCOPE SYNC

010102  122523                 ID103:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

010104  001402                         BEQ     AD103           ;BR IF "Z" = 1 - IT SHOULD BE

010106  000000                 E1D103: HALT                    ;CMPB FAILED TO SET "Z"
010110  000770                         BR      RD103           ;LOCK ON HARD ERROR

010112  022703  067615         AD103:  CMP     #DWTA+3,R3      ;DID DEST REG GET UPDATED?
010116  001402                         BEQ     BD103           ;BR IF YES

010120  000000                 E2D103: HALT                    ;CMPB FAILED TO UPDATE DEST REG
010122  000763                         BR      RD103           ;LOCK ON HARD ERROR

010124  022705  067620         BD103:  CMP     #DWTA+6,R5      ;DID SRC REG GET UPDATED?
010130  001402                         BEQ     CD103           ;BR IF YES

010132  000000                 E3D103: HALT                    ;CMPB FAILED TO UPDATE SRC REG
010134  000756                         BR      RD103           ;LOCK ON HARD ERROR

010136  020412                 CD103:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
010140  001404                         BEQ     TD104           ;BR IF NOT

010142  011203                         MOV     (R2),R3         ;GET WAS DATA
010144  000000                 E4D103: HALT                    ;CMPB DELIVERED A RESULT
010146  010412                         MOV     R4,(R2)         ;RESTORE [DEST]
010150  000750                         BR      RD103           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0104 BASIC "MOVB (RA)+,X(RB) - SRC EVEN / DEST EVEN
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                ; / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=000000

                                ;CODES:         [125] SPS=3  /  N:C=0100

                                ;SYNC:          BOSJ2 (-)       /       T=4.5 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-2 PS(Z)(1)H
                                ;  K3-6 BYTE INSTR H

010152  012700  000104       T0104:  MOV     #0104,R0                ;LOAD R0 WITH TEST NO.
010156  112760  000377  070162       MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010164  012702  067606               MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010170  012703  067602               MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010174  012704  177400               MOV     #177400,R4      ;RESULT S / B = 177400
010200  012705  070152       R0104:  MOV     #DBTA,R5        ;SRC ADDR = DBTA
010204  012712  177777               MOV     #-1,(R2)        ;[DEST] = 177777
010210  000257                       CCC                     ;SCOPE SYNC

010212  112563  000004       I0104:  MOVB    (R5)+,4(R3)     ;TEST THE MOVB

010216  020412                       CMP     R4,(R2)         ;RESULT OK?
010220  001403                       BEQ     A0104           ;BR IF YES

010222  011203                       MOV     (R2),R3         ;GET WAS DATA
010224  000000               E10104: HALT                    ;MOV DELIVERED WRONG RESULT
010226  000764                       BR      R0104           ;LOCK ON HARD ERROR

010230  022705  070153       A0104:  CMP     #DBTA+1,R5      ;DID SRC REG GET INCREMENTED BY +1
010234  001402                       BEQ     T0105           ;BR IF YES

010236  000000               E20104: HALT                    ;MOVB FAILED TO UPDATE SRC REG
010240  000757                       BR      R0104           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        .SBTTL T0105 BASIC "MOVB (RA)+,X(RB) - SRC ODD / DEST ODD
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,177 / 17[177]212,212
                                                        ; / 21[206]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125] SPS=3  /  N:C=1000

                                        ;SYNC:          BOSJ2 (-)       /       T=4.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-2 PS (N)(1) H
                                                        ;  K3-6 BYTE INSTR H

010242  012700  000105         T0105:  MOV     #0105,R0                ;LOAD R0 WITH TEST NO.
010246  112760  000377 070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010254  012702  067606                  MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010260  012703  067602                  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010264  012704  000777                  MOV     #777,R4         ;RESULT S / B = 777
010270  012705  070157         R0105:  MOV     #DBTB+1,R5      ;SRC ADDR = DBTB+1
010274  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
010300  000257                          CCC                     ;SCOPE SYNC

010302  112563  000005         I0105:  MOVB    (R5)+,5(R3)     ;TEST THE MOVB

010306  020412                          CMP     R4,(R2)         ;RESULT OK?
010310  001403                          BEQ     A0105           ;BR IF YES

010312  011203                          MOV     (R2),R3         ;GET WAS DATA
010314  000000                 E10105:  HALT                    ;MOV DELIVERED WRONG RESULT
010316  000764                          BR      R0105           ;LOCK ON HARD ERROR

010320  022705  070160         A0105:  CMP     #DBTB+2,R5      ;DID SRC REG GET INCREMENTED BY +1
010324  001402                          BEQ     T0106           ;BR IF YES

010326  000000                 E20105:  HALT                    ;MOVB FAILED TO UPDATE SRC REG
010330  000757                          BR      R0105           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0106 BASIC "MOVB (RA)+,X(RB) - SRC EVEN / DEST ODD
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                ; / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=177777

                                ;CODES:         [125] SPS=3  /  N:C=1000

                                ;SYNC:          BOSJ2 (-)       /       T=4.5 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-2 PS (N)(1) H
                                ;  K3-6 BYTE INSTR

010332  012700  000106       T0106:  MOV     #0106,R0                ;LOAD R0 WITH TEST NO.
010336  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010344  012702  067606                 MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010350  012703  067602                 MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010354  012704  000377                 MOV     #377,R4         ;RESULT S / B = 377
010360  012705  070152       R0106:    MOV     #DBTA,R5        ;SRC ADDR = DBTA
010364  012712  177777                 MOV     #-1,(R2)        ;[DEST] = 177777
010370  000257                         CCC                     ;SCOPE SYNC

010372  112563  000005       I0106:    MOVB    (R5)+,5(R3)     ;TEST THE MOVB

010376  020412                         CMP     R4,(R2)         ;RESULT OK?
010400  001403                         BEQ     A0106           ;BR IF YES

010402  011203                         MOV     (R2),R3         ;GET WAS DATA
010404  000000       E10106:   HALT                            ;MOV DELIVERED WRONG RESULT
010406  000764                 BR      R0106                   ;LOCK ON HARD ERROR

010410  022705  070153       A0106:    CMP     #DBTA+1,R5      ;DID SRC REG GET INCREMENTED BY +1
010414  001402                         BEQ     T0107           ;BR IF YES

010416  000000       E20106:   HALT                            ;MOVB FAILED TO UPDATE SRC REG
010420  000757                 BR      R0106                   ;LOCK ON HARD ERROR
```

```
6768                                    ; ************************************************************************
6769                                            .SBTTL T0107 BASIC "MOVB (RA)+,X(RB) - SRC ODD / DEST EVEN
6770                                    ; ************************************************************************
6771
6772                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6773
6774                                    ;ROM SEQ:       [142,240,250,137,251,177,206,212,202,205,125,375,016] FC 1,2,4
6775
6776                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,177 / 17[177]212,212
6777                                                    ; / 21[206]200,202 / 16[125]016,016
6778
6779                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
6780
6781                                    ;CODES:         [125] SPS=3  /  N:C=0000
6782
6783                                    ;SYNC:          BOSJ2 (-)       /       T=4.5 USEC
6784
6785                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
6786
6787  010422  012700  000107            T0107:  MOV     #0107,R0                ;LOAD R0 WITH TEST NO.
6788  010426  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6789  010434  012702  067606                    MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
6790  010440  012703  067602                    MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
6791  010444  012704  177401                    MOV     #177401,R4      ;RESULT S / B = 177401
6792  010450  012705  070157            R0107:  MOV     #DBTB+1,R5      ;SRC ADDR = DBTB+1
6793  010454  012712  177777                    MOV     #-1,(R2)        ;[DEST] = 177777
6794  010460  000257                            CCC                     ;SCOPE SYNC
6795
6796  010462  112563  000004            I0107:  MOVB    (R5)+,4(R3)     ;TEST THE MOVB
6797
6798  010466  020412                            CMP     R4,(R2)         ;RESULT OK?
6799  010470  001403                            BEQ     A0107           ;BR IF YES
6800
6801  010472  011203                            MOV     (R2),R3         ;GET WAS DATA
6802  010474  000000            E10107: HALT                            ;MOV DELIVERED WRONG RESULT
6803  010476  000764                            BR      R0107           ;LOCK ON HARD ERROR
6804
6805  010500  022705  070160    A0107:  CMP     #DBTB+2,R5      ;DID SRC REG GET INCREMENTED BY +1
6806  010504  001402                            BEQ     T0110           ;BR IF YES
6807
6808  010506  000000            E20107: HALT                            ;MOVB FAILED TO UPDATE SRC REG
6809  010510  000757                            BR      R0107           ;LOCK ON HARD ERROR
6810
```

```
6811                                    ; ***************************************************************************
6812                                            .SBTTL TO110 BASIC "MOVB 2(RA),(RB)+" TEST - SRC EVEN / DEST EVEN
6813                                    ; ***************************************************************************
6814
6815                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
6816
6817                                    ;ROM SEQ:       [146,241,242,247,250,172,257,202,205,125,375,016] FC 1,2,4
6818
6819                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,172 / 22[172]200,202 / 16[125]016,016
6820
6821                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
6822
6823                                    ;CODES:         [125] SPS=3  /  N:C=0000
6824
6825                                    ;SYNC:          BOSJ2 (-)       /       T=4.2 USEC
6826
6827                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
6828
6829  010512  012700  000110            TO110:  MOV     #0110,R0                ;LOAD R0 WITH TEST NO.
6830  010516  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
6831  010524  012702  067602                    MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
6832  010530  012704  177401                    MOV     #177401,R4      ;RESULT S / B = 177401
6833  010534  012705  070136                    MOV     #DWTB,R5        ;SRC ADDR = DWTB
6834  010540  010203                    RO110:  MOV     R2,R3           ;R3 GETS DEST ADDR
6835  010542  012713  177777                    MOV     #-1,(R3)        ;[DEST] = 177400
6836  010546  000257                            CCC                     ;SCOPE SYNC
6837
6838  010550  116523  000002            IO110:  MOVB    2(R5),(R3)+     ;TEST THE MOVB
6839
6840  010554  020412                            CMP     R4,(R2)         ;RESULT OK?
6841  010556  001403                            BEQ     AO110           ;BR IF YES
6842
6843  010560  011203                            MOV     (R2),R3         ;GET WAS DATA
6844  010562  000000                    E10110: HALT                    ;MOVB DELIVERED WRONG RESULT
6845  010564  000765                            BR      RO110           ;LOCK ON HARD ERROR
6846
6847  010566  022703  067603            AO110:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED?
6848  010572  001402                            BEQ     TO111           ;BR IF YES
6849
6850  010574  000000                    E20110: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
6851  010576  000760                            BR      RO110           ;LOCK ON HARD ERROR
6852
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0111 BASIC "MOVB 2(RA),(RB)+" TEST - SRC ODD / DEST EVEN
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [146,241,242,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4
                                ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
                                ; / 16[125]016,016
                                ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
                                ;CODES:         [125] SPS=3  / N:C=0000
                                ;SYNC:          B05J2 (-)       /       T=4.2 USEC
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
010600  012700  000111          T0111:  MOV     #0111,R0                ;LOAD R0 WITH TEST NO.
010604  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010612  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010616  012704  177401                  MOV     #177401,R4      ;RESULT S / B = 177401
010622  012705  070156                  MOV     #DBTB,R5        ;SRC ADDR = DBTB
010626  010203                  R0111:  MOV     R2,R3           ;R3 GETS DEST ADDR
010630  012713  177777                  MOV     #-1,(R3)        ;[DEST] = 177777
010634  000257                          CCC                     ;SCOPE SYNC
010636  116523  000001          I0111:  MOVB    1(R5),(R3)+     ;TEST THE MOVB
010642  020412                          CMP     R4,(R2)         ;RESULT OK?
010644  001403                          BEQ     A0111           ;BR IF YES
010646  011203                          MOV     (R2),R3         ;GET WAS DATA
010650  000000                  E10111: HALT                    ;MOVB DELIVERED WRONG RESULT
010652  000765                          BR      R0111           ;LOCK ON HARD ERROR
010654  022703  067603          A0111:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED?
010660  001402                          BEQ     T0112           ;BR IF YES
010662  000000                  E20111: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
010664  000760                          BR      R0111           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                                .SBTTL TO112 BASIC "MOVB 2(RA),(RB)+" TEST - SRC EVEN / DEST ODD
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [146,241,242,247,250,172,257,202,205,125,375,016] FC 1,2,4
                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,172 / 22[172]200,202 / 16[125]016,016
                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
                                        ;CODES:         [125] SPS=3  /  N:C=0000
                                        ;SYNC:          BOSJ2 (-)       /       T=4.2 USEC
                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
010666  012700  000112        TO112:  MOV     #0112,R0                ;LOAD R0 WITH TEST NO.
010672  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010700  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010704  012704  000777                MOV     #777,R4         ;RESULT S / B = 777
010710  012705  070136                MOV     #DWTB,R5        ;SRC ADDR = DWTB
010714  012703  067603        RO112:  MOV     #MBUF0+1,R3     ;R3 GETS DEST ADDR
010720  012712  177777                MOV     #-1,(R2)        ;[DEST] = 177777
010724  000257                        CCC                     ;SCOPE SYNC
010726  116523  000002        IO112:  MOVB    2(R5),(R3)+     ;TEST THE MOVB
010732  020412                        CMP     R4,(R2)         ;RESULT OK?
010734  001403                        BEQ     AO112           ;BR IF YES
010736  011203                        MOV     (R2),R3         ;GET WAS DATA
010740  000000        E10112: HALT                            ;MOVB DELIVERED WRONG RESULT
010742  000764                        BR      RO112           ;LOCK ON HARD ERROR
010744  022703  067604        AO112:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED?
010750  001402                        BEQ     TO113           ;BR IF YES
010752  000000        E20112: HALT                            ;MOVB FAILED TO AUTO INCREMENT DEST REG
010754  000757                        BR      RO112           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0113 BASIC "MOVB 2(RA),(RB)+" TEST - SRC ODD / DEST ODD
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [146,241,242,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4
                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
                                        ; / 16[125]016,016
                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
                                        ;CODES:         [125] SPS=3  /  N:C=0000
                                        ;SYNC:          B05J2 (-)       /       T=4.2 USEC
                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
010756  012700  000113        T0113:  MOV     #0113,R0                ;LOAD R0 WITH TEST NO.
010762  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010770  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010774  012704  000777                MOV     #777,R4         ;RESULT S / B = 777
011000  012705  070156                MOV     #DBTB,R5        ;SRC ADDR = DBTB
011004  012703  067603        R0113:  MOV     #MBUF0+1,R3     ;R3 GETS DEST ADDR = MBUF0+1
011010  012712  177777                MOV     #-1,(R2)        ;[DEST] = 177777
011014  000257                        CCC                     ;SCOPE SYNC
011016  116523  000001        I0113:  MOVB    1(R5),(R3)+     ;TEST THE MOVB
011022  020412                        CMP     R4,(R2)         ;RESULT OK?
011024  001403                        BEQ     A0113           ;BR IF YES
011026  011203                        MOV     (R2),R3         ;GET WAS DATA
011030  000000                E10113: HALT                    ;MOVB DELIVERED WRONG RESULT
011032  000764                        BR      R0113           ;LOCK ON HARD ERROR
011034  022703  067604        A0113:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED?
011040  001402                        BEQ     T0114           ;BR IF YES
011042  000000                E20113: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
011044  000757                        BR      R0113           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL TO114 BASIC "MOVB -(RA),RB" TEST - SRC EVEN ADDR
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [144,240,250,160,204,003,204,000] FC 1,2,4
                                ;
                                ;ACT BUTS:      37[004]100,144 / 35[240]120,160 / 20[160]000,003 / 27[003]000,000
                                ;
                                ;EXEC:          [003]ALUC=LLLLL :[204]D=177777
                                ;
                                ;CODES:         [204] SPS=3  /  N:C=1000
                                ;
                                ;SYNC:          B05J2 (-)       /       T=2 USEC
                                ;
                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K3-5 DOPL  /  K3-6 BYTE INSTR
                                ;  K5-2 PS (N)(1)H
                                ;
007000  011046  012700  000114  TO114:  MOV     #0114,R0                ;LOAD R0 WITH TEST NO.
007001  011052  112760  000377  070162  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007002  011060  012702  177703          MOV     #177703,R2      ;DEST ADDR = R3
007003  011064  012704  177777          MOV     #-1,R4          ;RESULT S / B = 177777
007004  011070  012705  067621  R0114:  MOV     #DWTA+7,R5      ;SRC ADDR = DWTA+7
007005  011074  005003                  CLR     R3              ;[DEST] = 000000
007006  011076  000257                  CCC                     ;SCOPE SYNC
007007
007008  011100  114503          I0114:  MOVB    -(R5),R3        ;TEST THE MOVB
007009
007010  011102  020403                  CMP     R4,R3           ;RESULT OK?
007011  011104  001402                  BEQ     A0114           ;BR IF YES
007012
007013  011106  000000          E10114: HALT                    ;MOVB FAILED - WRONG RESULT
007014  011110  000767                  BR      R0114           ;LOCK ON HARD ERROR
007015
007016  011112  022705  067620  A0114:  CMP     #DWTA+6,R5      ;SRC REG GET DECREMENTED?
007017  011116  001402                  BEQ     T0115           ;BR IF YES
007018
007019  011120  000000          E20114: HALT                    ;MOVB FAILED TO UPDATE SRC REG
007020  011122  000762                  BR      R0114           ;LOCK ON HARD ERROR
```

```
7021                                    ; ***************************************************************************
7022                                          .SBTTL T0115 BASIC "MOVB -(RA),RB" TEST - SRC ODD ADDR
7023                                    ; ***************************************************************************
7024
7025                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7026
7027                                    ;ROM SEQ:       [144,240,250,137,251,160,204,003,204,000] FC 1,2,4
7028
7029                                    ;ACT BUTS:      37[004]100,144 / 35[240]120,137 / 36[137]120,160 / 20[160]000,003
7030                                                    ; / 27[003]000,000
7031
7032                                    ;EXEC:          [003]ALUC=LLLLL :[204]D=177777
7033
7034                                    ;CODES:         [204] SPS=3  /  N:C=1000
7035
7036                                    ;SYNC:          B05J2 (-)       /       T= 2 USEC
7037
7038                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K5-5 DOPL  /  K3-6 BYTE INSTR H
7039                                                    ;  K5-2 PS(N)(1)H
7040
7041  011124  012700  000115        T0115:  MOV     #0115,R0                ;LOAD R0 WITH TEST NO.
7042  011130  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7043  011136  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
7044  011142  012704  177777                MOV     #-1,R4          ;RESULT S / B = 177777
7045  011146  012705  067620        R0115:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
7046  011152  005003                        CLR     R3              ;[DEST] = 000000
7047  011154  000257                        CCC                     ;SCOPE SYNC
7048
7049  011156  114503                I0115:  MOVB    -(R5),R3        ;TEST THE MOVB
7050
7051  011160  020403                        CMP     R4,R3           ;RESULT OK?
7052  011162  001402                        BEQ     A0115           ;BR IF YES
7053
7054  011164  000000                E10115: HALT                    ;MOVB FAILED - WRONG RESULT
7055  011166  000767                        BR      R0115           ;LOCK ON HARD ERROR
7056
7057  011170  022705  067617        A0115:  CMP     #DWTA+5,R5      ;SRC REG GET DECREMENTED?
7058  011174  001402                        BEQ     T0116           ;BR IF YES
7059
7060  011176  000000                E20115: HALT                    ;MOVB FAILED TO UPDATE SRC REG
7061  011200  000762                        BR      R0115           ;LOCK ON HARD ERROR
7062
```

```
7063                                    ; ************************************************************************
7064                                    .SBTTL TO116 BASIC "MOVB (RA)+,-(SP)" TEST - SRC ADDR EVEN
7065                                    ; ************************************************************************
7066
7067                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7068
7069                                    ;ROM SEQ:       [142,240,250,174,257,202,205,125,375,016] FC 1,2,4
7070
7071                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,202 / 16[125]016,016
7072
7073                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=000000
7074
7075                                    ;CODES:         [125] SPS=3  /  N:C=0100
7076
7077                                    ;SYNC:          BOSJ2 (-)       /       T= 3.3 USEC
7078
7079                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=4L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7080                                                    ;  K5-2 PS(Z)(1)H
7081
7082  011202  012700  000116           TO116:  MOV     #0116,R0                ;LOAD R0 WITH TEST NO.
7083  011206  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7084  011214  010605                           MOV     SP,R5           ;SAVE SP
7085  011216  012704  177400                   MOV     #177400,R4      ;RESULT S / B = 177400
7086  011222  010506                   RO116:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
7087  011224  012703  070152                   MOV     #DBTA,R3        ;SRC ADDR = DBTA
7088  011230  012746  177777                   MOV     #-1,-(SP)       ;[DEST] = 177777
7089  011234  010602                           MOV     SP,R2           ;R2 GETS DEST ADDR
7090  011236  005726                           TST     (SP)+           ;RESET SP
7091  011240  000257                           CCC                     ;SCOPE SYNC
7092
7093  011242  112346                   IO116:  MOVB    (R3)+,-(SP)     ;TEST THE MOVB
7094
7095  011244  022703  070153                   CMP     #DBTA+1,R3      ;DID MOVB INCREMENT SRC REG?
7096  011250  001402                           BEQ     AO116           ;BR IF YES
7097
7098  011252  000000                   EO116:  HALT                    ;MOVB FAILED TO UPDATE SRC REG
7099  011254  000762                           BR      RO116           ;LOCK ON HARD ERROR
7100
7101  011256  020412                   AO116:  CMP     R4,(R2)         ;RESULT OK?
7102  011260  001403                           BEQ     BO116           ;BR IF YES
7103
7104  011262  011203                           MOV     (R2),R3         ;GET WAS DATA
7105  011264  000000                   E10116: HALT                    ;MOVB FAILED TO DELIVER CORRECT RESULT
7106  011266  000755                           BR      RO116           ;LOCK ON HARD ERROR
7107
7108  011270  020206                   BO116:  CMP     R2,SP           ;DID SP GET PUSHED BY 2 ?
7109  011272  001402                           BEQ     CO116           ;BR IF YES
7110
7111  011274  000000                   E20116: HALT                    ;MOVB FAILED TO PUSH SP PROPERLY
7112  011276  000751                           BR      RO116           ;LOCK ON HARD ERROR
7113
7114  011300  010506                   CO116:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
7115
7116
```

```
7117                                    ; ***************************************************************************
7118                                    .SBTTL T0117 BASIC "MOVB (RA)+,-(SP)" TEST - SRC ADDR ODD
7119                                    ; ***************************************************************************
7120
7121                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7122
7123                                    ;ROM SEQ:       [142,240,250,137,251,174,257,202,205,125,375,016] FC 1,2,4
7124
7125                                    ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,174 / 22[174]200,202
7126                                                    ; / 16[125]016,016
7127
7128                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=000000
7129
7130                                    ;CODES:         [125] SPS=3  /  N:C=0100
7131
7132                                    ;SYNC:          BOSJ2 (-)       /       T= 3.3 USEC
7133
7134                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=4L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7135                                                    ;  K5-2 PS(Z)(1)H
7136
7137  011302  012700  000117        T0117:  MOV     #0117,R0                ;LOAD R0 WITH TEST NO.
7138  011306  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7139  011314  010605                        MOV     SP,R5           ;SAVE SP
7140  011316  012704  177400                MOV     #177400,R4      ;RESULT S / B = 177400
7141  011322  010506                R0117:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
7142  011324  012703  070141                MOV     #DWTB+3,R3      ;SRC ADDR = DWTB+3
7143  011330  012746  177777                MOV     #-1,-(SP)       ;[DEST] = 177777
7144  011334  010602                        MOV     SP,R2           ;R2 GETS DEST ADDR
7145  011336  005726                        TST     (SP)+           ;RESET SP
7146  011340  000257                        CCC                     ;SCOPE SYNC
7147
7148  011342  112346                I0117:  MOVB    (R3)+,-(SP)     ;TEST THE MOVB
7149
7150  011344  022703  070142                CMP     #DWTB+4,R3      ;DID MOVB INCREMENT SRC REG?
7151  011350  001402                        BEQ     A0117           ;BR IF YES
7152
7153  011352  000000                E0117:  HALT                    ;MOVB FAILED TO UPDATE SRC REG
7154  011354  000762                        BR      R0117           ;LOCK ON HARD ERROR
7155
7156  011356  020412                A0117:  CMP     R4,(R2)         ;RESULT OK?
7157  011360  001403                        BEQ     B0117           ;BR IF YES
7158
7159  011362  011203                        MOV     (R2),R3         ;GET WAS DATA
7160  011364  000000                E10117: HALT                    ;MOVB FAILED TO DELIVER CORRECT RESULT
7161  011366  000755                        BR      R0117           ;LOCK ON HARD ERROR
7162
7163  011370  020206                B0117:  CMP     R2,SP           ;DID SP GET PUSHED BY 2
7164  011372  001402                        BEQ     C0117           ;BR IF YES
7165
7166  011374  000000                E20117: HALT                    ;MOVB FAILED TO PUSH SP
7167  011376  000751                        BR      R0117           ;LOCK ON HARD ERROR
7168
7169  011400  010506                C0117:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
7170
```

```
7171                                    ; ***************************************************************************
7172                                    .SBTTL T0120 BASIC "MOVB X(R),@#A" TEST - SRC EVEN / DEST EVEN
7173                                    ; ***************************************************************************
7174
7175                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7176
7177                                    ;ROM SEQ:       [146,241,242,247,250,173,207,210,202,205,125,375,016] FC 1,2,4
7178
7179                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,173 / 22[207]200,202 / 16[125]016,016
7180
7181                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
7182
7183                                    ;CODES:         [125] SPS=3  /  N:C=0000
7184
7185                                    ;SYNC:          BOSJ2 (-)       /       T= 4.7 USEC
7186
7187                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7188
7189  011402  012700  000120           T0120:  MOV     #0120,R0                ;LOAD R0 WITH TEST NO.
7190  011406  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7191  011414  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
7192  011420  012704  000001                   MOV     #1,R4           ;RESULT S / B = 1
7193  011424  012705  070136                   MOV     #DWTB,R5        ;BASE SRC ADDR = DWTB
7194  011430  005012                   R0120:  CLR     (R2)            ;[DEST] = 000000
7195  011432  000257                           CCC                     ;SCOPE SYNC
7196
7197  011434  116537  000006  067602   I0120:  MOVB    6(R5),@#MBUF0   ;TEST THE MOVB
7198
7199  011442  020412                           CMP     R4,(R2)         ;RESULT OK?
7200  011444  001403                           BEQ     T0121           ;BR IF YES
7201
7202  011446  011203                           MOV     (R2),R3         ;GET WAS DATA
7203  011450  000000                   E0120:  HALT                    ;MOVB DELIVERED WRONG RESULT
7204  011452  000766                           BR      R0120           ;LOCK ON HARD ERRROR
```

```
7205                                    ; ***************************************************************************
7206                                    .SBTTL T0121 BASIC "MOVB X(R),@#A" TEST - SRC ODD / DEST EVEN
7207                                    ; ***************************************************************************
7208
7209                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7210
7211                                    ;ROM SEQ:       [146,241,242,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4
7212
7213                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 22[207]200,202 / 16[125]016,016
7214
7215                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
7216
7217                                    ;CODES:         [125] SPS=3  /  N:C=0000
7218
7219                                    ;SYNC:          BOSJ2 (-)       /       T= 4.7 USEC
7220
7221                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7222
7223  011454  012700  000121            T0121:  MOV     #0121,R0                ;LOAD R0 WITH TEST NO.
7224  011460  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7225  011466  012702  067602                    MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
7226  011472  012704  000001                    MOV     #1,R4           ;RESULT S / B = 1
7227  011476  012705  070156                    MOV     #DBTB,R5        ;BASE SRC ADDR = DBTB
7228  011502  005012                    R0121:  CLR     (R2)            ;[DEST] = 000000
7229  011504  000257                            CCC                     ;SCOPE SYNC
7230
7231  011506  116537  000001  067602    I0121:  MOVB    1(R5),@#MBUF0   ;TEST THE MOVB
7232
7233  011514  020412                            CMP     R4,(R2)         ;RESULT OK?
7234  011516  001403                            BEQ     T0122           ;BR IF YES
7235
7236  011520  011203                            MOV     (R2),R3         ;GET WAS DATA
7237  011522  000000                    E0121:  HALT                    ;MOVE DELIVERED WRONG RESULT
7238  011524  000766                            BR      R0121           ;LOCK ON HARD ERRROR
```

```
7239                                    ; ***************************************************************************
7240                                            .SBTTL T0122 BASIC "MOVB X(R),@#A" TEST - SRC EVEN / DEST ODD
7241                                    ; ***************************************************************************
7242
7243                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7244
7245                                    ;ROM SEQ:       [146,241,242,247,250,173,207,210,202,205,125,375,016] FC 1,2,4
7246
7247                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,177 / 21[206]200,202 / 16[125]016,016
7248
7249                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=000401
7250
7251                                    ;CODES:         [125] SPS=3  /  N:C=0000
7252
7253                                    ;SYNC:          BOSJ2 (-)       /       T= 4.7 USEC
7254
7255                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7256
7257  011526  012700  000122            T0122:  MOV     #0122,R0                ;LOAD R0 WITH TEST NO.
7258  011532  112760  000377  070162            MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7259  011540  012702  067602                    MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
7260  011544  012704  000400                    MOV     #400,R4         ;RESULT S  B = 400
7261  011550  012705  070136                    MOV     #DWTB,R5        ;BASE SRC ADDR = DWTB
7262  011554  005012                    R0122:  CLR     (R2)            ;[DEST] = 000000
7263  011556  000257                            CCC                     ;SCOPE SYNC
7264
7265  011560  116537  000006  067603    I0122:  MOVB    6(R5),@#MBUF0+1 ;TEST THE MOVB
7266
7267  011566  020412                            CMP     R4,(R2)         ;RESULT OK?
7268  011570  001403                            BEQ     T0123           ;BR IF YES
7269
7270  011572  011203                            MOV     (R2),R3         ;GET WAS DATA
7271  011574  000000                    E0122:  HALT                    ;MOVB DELIVERED WRONG RESULT
7272  011576  000766                            BR      R0122           ;LOCK ON HARD ERRROR
```

```
7273                                    ; ******************************************************************************
7274                                    .SBTTL TO123 BASIC "MOVB X(R),@#A" TEST - SRC ODD / DEST ODD
7275                                    ; ******************************************************************************
7276
7277                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7278
7279                                    ;ROM SEQ:       [146,241,242,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4
7280
7281                                    ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,173 / 22[207]200,202
7282                                                    ; / 16[125]016,016
7283
7284                                    ;EXEC:          [205]ALUC=LLLLL :[125]D=001001
7285
7286                                    ;CODES:         [125] SPS=3  /  N:C=0000
7287
7288                                    ;SYNC:          B05J2 (-)       /       T= 4.7 USEC
7289
7290                                    ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
7291
7292  011600  012700  000123           TO123:  MOV     #0123,R0                ;LOAD R0 WITH TEST NO.
7293  011604  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7294  011612  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
7295  011616  012704  000400                   MOV     #400,R4         ;RESULT S / B = 400
7296  011622  012705  070156                   MOV     #DBTB,R5        ;BASE SRC ADDR = DBTB
7297  011626  005012                   R0123:  CLR     (R2)            ;[DEST] = 000000
7298  011630  000257                           CCC                     ;SCOPE SYNC
7299
7300  011632  116537  000001  067603   I0123:  MOVB    1(R5),@#MBUF0+1 ;TEST THE MOVB
7301
7302  011640  020412                           CMP     R4,(R2)         ;RESULT OK?
7303  011642  001403                           BEQ     TO124           ;BR IF YES
7304
7305  011644  011203                           MOV     (R2),R3         ;GET WAS DATA
7306  011646  000000                   E0123:  HALT                    ;MOVB DELIVERED WRONG RESULT
7307  011650  000766                           BR      R0123           ;LOCK ON HARD ERRROR
7308
```

```
                                ; ***************************************************************************
                                        .SBTTL T0124 BASIC "RTS  PC" TEST
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [124,323,324,325,016] FC 1,6
                                ;
                                ;ACT BUTS:      37[004]100,124 / 16[324]016,016
                                ;
                                ;EXEC:          N / A
                                ;
                                ;CODES:         N / A
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 2.5 USEC
                                ;
                                ;KEY SIG:       K3-6 RTSL
                                ;
011652  012700  000124          T0124:  MOV     #0124,R0                ;LOAD R0 WITH TEST NO.
011656  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011664  010605                  MOV     SP,R5           ;SAVE THE ORIGINAL SP
011666  010506                  R0124:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011670  012746  011704                  MOV     #A0124,-(SP)    ;PUSH NEW PC ON STACK
011674  000257                  CCC                     ;SCOPE SYNC
                                ;
011676  000207                  I0124:  RTS     PC              ;TEST THE RTS - GO TO A0124
                                ;
011700  000000                  E10124: HALT
011702  000771                  BR      R0124           ;LOCK ON HARD ERROR
                                ;
011704  020605                  A0124:  CMP     SP,R5           ;DID SP GET POPPED ?
011706  001402                  BEQ     T0125           ;BR IF YES
                                ;
011710  000000                  E20124: HALT
011712  000765                  BR      R0124           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL T0125 BASIC "JSR  PC,@#A" TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [153,303,307,310,311,312,306,313,016] FC 1,5

                                ;ACT BUTS:      37[004]100,153 / 15[153]306,307 / 16[306]016,016

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 3.5 USEC

                                ;KEY SIG:       K3-5 JMP+JSRH  /  K3-3 DM=3L

011714  012700  000125          T0125:  MOV     #0125,R0                ;LOAD R0 WITH TEST NO.
011720  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011726  010605                          MOV     SP,R5           ;SAVE ORIGINAL SP
011730  010506                  R0125:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011732  000257                          CCC                     ;SCOPE SYNC

011734  004737  011744          I0125:  JSR     PC,@#A0125      ;TEST THE JSR - GO TO A0125

011740  000000          E10125: HALT                            ;JSR FAILED TO LOAD PC
011742  000772                  BR      R0125           ;LOCK ON HARD ERROR

011744  022726  011740          A0125:  CMP     #E10125,(SP)+   ;DID JSR SAVE OLD PC ON STACK ?
011750  001402                  BEQ     T0126           ;BR IF YES

011752  000000          E20125: HALT                            ;JSR FAILED TO SAVE OLD PC
011754  000765                  BR      R0125           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL T0126 BASIC "RTI" TEST - N:C=0000
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [101,320,321,322,017,015,013] FC 6,10
                                        ;ACT BUTS:      37[004]100,101 / 26[017]010,013
                                        ;EXEC:          N / A
                                        ;CODES:         N / A
                                        ;SYNC:          B05J2 (-)       /       T= 3 USEC
                                        ;KEY SIG:       K3-6 RTI+RTTL
011756  012700  000126      070162    T0126:  MOV     #0126,R0                ;LOAD R0 WITH TEST NO.
011762  112760  000377                        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011770  010605                            MOV     SP,R5           ;SAVE THE SP
011772  010506                    R0126:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOP
011774  012746  000357                    MOV     #357,-(SP)      ;NEW PSW = 357
012000  012746  012020                    MOV     #A0126,-(SP)    ;NEW PC = A0126
012004  005037  177776                    CLR     @#PSW           ;MAKE [PSW] = 000
012010  000257                            CCC                     ;MAKE N:C=0000
012012  000002                    I0126:  RTI                     ;TEST THE RTI - GO TO A0126
012014  000000                    E10126: HALT                    ;RTI FAILED TO LOAD PC
012016  000765                            BR      R0126           ;LOOP ON HARD ERROR
012020  013702  177776            A0126:  MOV     @#PSW,R2        ;SAVE THE [PSW] IN R2
012024  022702  000357                    CMP     #357,R2         ;WAS [PSW] = 357 ?
012030  001404                            BEQ     B0126           ;BR IF YES
012032  010237  177776                    MOV     R2,@#PSW        ;RESTORE THE ERROR PSW
012036  000000                    E20126: HALT                    ;RTI FAILED TO LOAD PSW
012040  000754                            BR      R0126           ;LOCK ON HARD ERROR
012042  020605                    B0126:  CMP     SP,R5           ;DID SP GET UPDATED OK ?
012044  001402                            BEQ     T0127           ;BR IF YES
012046  000000                    E30126: HALT                    ;RTI FAILED TO UPDATE THE SP
012050  000750                            BR      R0126           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************************
                                        .SBTTL TO127 BASIC "RTI" TEST WITH N:C=1111
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [101,320,321,322,017,015,013] FC 6,10
                                ;
                                ;ACT BUTS:      37[004]100,101 / 26[017]010,013
                                ;
                                ;EXEC:          N / A
                                ;
                                ;CODES:         N / A
                                ;
                                ;SYNC:          B05J2 (-)       /       T= 3 USEC
                                ;
                                ;KEY SIG:       K3-6 RTI+RTTL
                                ;
012052  012700  000127          TO127:  MOV     #0127,R0                ;LOAD R0 WITH TEST NO.
012056  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012064  010605                          MOV     SP,R5           ;SAVE THE SP IN R5
012066  010506                  R0127:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012070  005046                          CLR     -(SP)           ;NEW PSW = 000000
012072  012746  012110                  MOV     #A0127,-(SP)    ;NEW PC = A0127
012076  012737  000357  177776          MOV     #357,@#PSW      ;MAKE OLD PSW = 357
012104  000240                          NOP                     ;SCOPE SYNC
                                ;
012106  000002                  I0127:  RTI                     ;TEST THE RTI - GO TO A0127
                                ;
012110  013702  177776          A0127:  MOV     @#PSW,R2        ;GET THE PSW
012114  022702  000000                  CMP     #0,R2           ;WAS [PSW]=000
012120  001404                          BEQ     TO!30           ;BR IF YES
                                ;
012122  010237  177776                  MOV     R2,@#PSW        ;RESTORE ERROR PSW
012126  000000                  E0127:  HALT                    ;RTI FAILED TO CLEAR PSW
012130  000756                          BR      R0127           ;LOCK ON HARD ERROR
                                ;
```

```
7463                                    ; ***************************************************************
7464                                            .SBTTL T0130 BASIC "IOT" TEST -VERIFY LOADING PSW WITH 357
7465                                    ; ***************************************************************
7466
7467                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
7468
7469                                    ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10
7470
7471                                    ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
7472                                                    ; / 26[123]010,013
7473
7474                                    ;EXEC:          N / A
7475
7476                                    ;CODES:         N / A
7477
7478                                    ;SYNC:          BO5J2 (-)       /       T= 6 USEC
7479
7480                                    ;KEY SIG:       K3-6 TRAP INSTR L
7481
7482  012132  012700  000130           T0130:  MOV     #0130,R0                ;LOAD R0 WITH TEST NO.
7483  012136  112760  000377  070162           MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
7484  012144  010605                           MOV     SP,R5           ;SAVE THE SP
7485  012146  010506                   R0130:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
7486  012150  012737  012206  000020           MOV     #A0130,@#20     ;SET UP IOT VECTOR
7487  012156  012737  000357  000022           MOV     #357,@#22
7488  012164  012766  177777  177776           MOV     #-1,-2(SP)      ;IOT SHOULD CHANGE -1 TO 0
7489  012172  005037  177776                   CLR     @#PSW           ;MAKE [PSW] = 000
7490  012176  000257                           CCC                     ;SCOPE SYNC
7491
7492  012200  000004                   I0130:  IOT                     ;TEST THE IOT
7493
7494  012202  000000                   E10130: HALT                    ;IOT FAILED TO LOAD PC
7495  012204  000760                           BR      R0130           ;LOCK ON HARD ERROR
7496
7497  012206  013702  177776           A0130:  MOV     @#PSW,R2        ;GET THE PSW
7498  012212  022702  000357                   CMP     #357,R2         ;DID IOT LOAD A 357 ?
7499  012216  001404                           BEQ     B0130           ;BR IF YES
7500
7501  012220  010237  177776                   MOV     R2,@#PSW        ;RESTORE ERROR PSW
7502  012224  000000                   E20130: HALT                    ;IOT FAILED TO LOAD PSW
7503  012226  000747                           BR      R0130           ;LOCK ON HARD ERROR
7504
7505  012230  022726  012202           B0130:  CMP     #E10130,(SP)+   ;DID IOT SAVE OLD PC ?
7506  012234  001404                           BEQ     C0130           ;BR IF YES
7507
7508  012236  010237  177776                   MOV     R2,@#PSW        ;RESTORE ERROR PSW
7509  012242  000000                   E30130: HALT                    ;IOT FAILED TO SAVE OLD PC
7510  012244  000740                           BR      R0130           ;LOCK ON HARD ERROR
7511
7512  012246  005726                   C0130:  TST     (SP)+           ;DID IOT SAVE OLD PSW ?
7513  012250  001404                           BEQ     T0131           ;BR IF YES
7514
7515  012252  010237  177776                   MOV     R2,@#PSW        ;RESTORE ERROR PSW
7516  012256  000000                   E40130: HALT                    ;IOT FAILED TO SAVE OLD PSW
7517  012260  000732                           BR      R0130           ;LOCK ON HARD ERROR
7518
```

```
 7519
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL TO131 BASIC "IOT" TEST - VERIFY LINKAGE TO SCOPE SERVICE
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC           BOSJ2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 TRAP INSTR L

012262  012700  000131         TO131:  MOV     #0131,R0                ;LOAD R0 WITH TEST NO.
012266  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012274  010605                         MOV     SP,R5           ;SAVE SP
012276  010506                 RO131:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012300  005037  066702                 CLR     @#SCOFLG        ;TRAP SERVICE WILL COM "SCOFLG"
012304  012737  065260  000020         MOV     #SCOPEA,@#20    ;SET UP IOT VECTOR
012312  005037  000022                 CLR     @#22
012316  000257                         CCC                     ;SCOPE SYNC

012320  000004                 IO131:  SCOPE                   ;TEST THE IOT

012322  005137  066702                 COM     @#SCOFLG        ;SCOFLG SHOULD BECOME 000000
012326  001402                         BEQ     AO131           ;BR IF IT DID

012330  000000                 EO131:  HALT                    ;IOT FAILED TO LINK TO SCOPE SERVICE
012332  000761                         BR      RO131           ;LOCK ON HARD ERROR

012334  010506                 AO131:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0132 BASIC "IOT" TEST -VERIFY LOADING PSW WITH 357
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                ; / 26[123]010,013

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          BOSJ2 (-)       /       T= 6 USEC

                                ;KEY SIG:       K3-6 TRAP INSTR L

012336  012700  000132         T0132:  MOV     #0132,R0                ;LOAD R0 WITH TEST NO.
012342  112760  000377  070162         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012350  010605                         MOV     SP,R5           ;SAVE THE SP
012352  010506                 R0132:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012354  012737  012412  000020         MOV     #A0132,@#20     ;SET UP IOT VECTOR
012362  012737  000357  000022         MOV     #357,@#22
012370  012766  177777  177776         MOV     #-1,-2(SP)      ;IOT SHOULD CHANGE -1 TO 0
012376  005037  177776                 CLR     @#PSW           ;MAKE [PSW] = 000
012402  000257                         CCC                     ;SCOPE SYNC

012404  000004                 I0132:  IOT                     ;TEST THE IOT

012406  000000                 E10132: HALT                    ;IOT FAILED TO LOAD PC
012410  000760                         BR      R0132           ;LOCK ON HARD ERROR

012412  013702  177776         A0132:  MOV     @#PSW,R2        ;GET THE PSW
012416  022702  000357                 CMP     #357,R2         ;DID IOT LOAD A 357 ?
012422  001404                         BEQ     B0132           ;BR IF YES

012424  010237  177776                 MOV     R2,@#PSW        ;RESTORE ERROR PSW
012430  000000                 E20132: HALT                    ;IOT FAILED TO LOAD PSW
012432  000747                         BR      R0132           ;LOCK ON HARD ERROR

012434  022726  012406         B0132:  CMP     #E10132,(SP)+   ;DID IOT SAVE OLD PC ?
012440  001404                         BEQ     C0132           ;BR IF YES

012442  010237  177776                 MOV     R2,@#PSW        ;RESTORE ERROR PSW
012446  000000                 E30132: HALT                    ;IOT FAILED TO SAVE OLD PC
012450  000740                         BR      R0132           ;LOCK ON HARD ERROR

012452  005726                 C0132:  TST     (SP)+           ;DID IOT SAVE OLD PSW ?
012454  001404                         BEQ     T0133           ;BR IF YES

012456  010237  177776                 MOV     R2,@#PSW        ;RESTORE ERROR PSW
012462  000000                 E40132: HALT                    ;IOT FAILED TO SAVE OLD PSW
012464  000732                         BR      R0132           ;LOCK ON HARD ERROR
```

DBQEAB.CMB   T0132 BASIC "IOT" TEST -VERIFY LOADING PSW WITH 357

```
7613
```

```
                                ; ************************************************************************
                                ;       .SBTTL TD133 BASIC IOT TEST - VERIFY LOADING PSW WITH 000
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,323,333,123,015,013] FC 1,6,10
                                ;
                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                ;               ; / 26[123]010,013
                                ;
                                ;EXEC:          N / A
                                ;
                                ;CODES:         N / A
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 6 USEC
                                ;
                                ;KEY SIG:       K3-6 TRAP INSTR L
                                ;
012466  012700  000133          TD133:  MOV     #0133,R0                ;LOAD R0 WITH TEST NO.
012472  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012500  010605                  MOV     SP,R5           ;SAVE THE SP
012502  010506                  RD133:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012504  012737  012530  000020          MOV     #A0133,@#20     ;SET UP IOT VECTOR
012512  005037  000022                  CLR     @#22            ;
012516  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW] = 340
012524  000277                  SCC                             ;MAKE N:C=1111
                                ;
012526  000004                  IO133:  IOT                     ;TEST THE IOT
                                ;
012530  013702  177776          A0133:  MOV     @#PSW,R2        ;GET THE [PSW]
012534  001404                  BEQ     B0133           ;BR IF [PSW] = 000
                                ;
012536  010237  177776                  MOV     R2,@#PSW        ;RESTORE THE ERROR PSW
012542  000000                  E0133:  HALT                    ;IOT FAILED TO CLEAR THE PSW
012544  000756                  BR      RD133           ;LOCK ON HARD ERROR
                                ;
012546  010506                  B0133:  MOV     R5,SP           ;RESET THE SP BEFORE CONTINUING
                                ;
                                ;
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0134 BASIC "TRAP" TEST - LINKAGE TO PRINT ROUTINE
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10
                                ;
                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                ;               ; / 26[123]010,013
                                ;
                                ;EXEC:          N / A
                                ;
                                ;CODES:         N / A
                                ;
                                ;SYNC:          BOSJ2 (-)       /       T= 6 USEC
                                ;
                                ;KEY SIG:       K3-6 TRAP INSTR L
                                ;
012550  012700  000134        T0134:  MOV     #0134,R0                ;LOAD R0 WITH TEST NO.
012554  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012562  032737  000004  066642          BIT     #4,@#BPTLOC     ;BREAKPOINT HALT SET ??
012570  001401                        BEQ     .+4             ;BR IF NOT
012572  000000                        HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
012574  010605                        MOV     SP,R5           ;SAVE THE SP
012576  010506                R0134:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012600  012737  066042  000034        MOV     #PRINA,@#34     ;SET UP THE "TRAP" VECTOR
012606  005037  000036                CLR     @#36
012612  005037  066674                CLR     @#PRIFLG        ;INITIALIZE TEST FLAG
012616  000257                        CCC                     ;SCOPE SYNC
                                ;
012620  104400                I0134:  TYPE                    ;TEST THE TRAP
                                ;
012622  005137  066674                COM     @#PRIFLG        ;SHOULD MAKE [PRIFLG] = 000000
012626  001402                        BEQ     T0135           ;BR IF IT DID
                                ;
012630  000000                E0134:  HALT                    ;TRAP FAILED TO LINK TO PRINT SERV.
012632  000761                        BR      R0134           ;LOCK ON HARD ERROR
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL T0135 BASIC "EMT" TEST - LINKAGE TO ERROR SERVICE
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                ; / 26[123]010,013

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          BOSJ2 (-)       /       T= 6 USEC

                                ;KEY SIG:       K3-6 TRAP INSTR L

012634  012700  000135        T0135:  MOV     #0135,R0                ;LOAD R0 WITH TEST NO.
012640  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012646  010605                        MOV     SP,R5           ;SAVE THE SP
012650  010506                R0135:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012652  012737  065400  000030        MOV     #ERRA,@#30      ;SET UP THE EMT VECTOR
012660  005037  000032                CLR     @#32
012664  005037  066676                CLR     @#ERRFLG        ;EMT SERVICE WILL COM [ERRFLG]
012670  000257                        CCC                     ;SCOPE SYNC

012672  104000                I0135:  ERROR                   ;TEST THE EMT

012674  005137  066676                COM     @#ERRFLG        ;DID EMT SERV. COM ERRFLG?
012700  001402                        BEQ     T0136           ;BR IF YES

012702  000000                E0135:  HALT                    ;EMT DID NOT LINK PROPERLY
012704  000761                        BR      R0135           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0136 BASIC TEST OF RSVD INSTR. TRAP LINKAGE
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [100,126,007,115,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                ;ACT BUTS:      37[004]100,100 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                ; / 26[123]010,013

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                ;KEY SIG:       K3-6 RSVD INSTR L

012706  012700  000136          T0136:  MOV     #0136,R0                ;LOAD R0 WITH TEST NO.
012712  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012720  013701  012752                  MOV     @#I0136,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
012724  010605                          MOV     SP,R5           ;SAVE THE SP
012726  012737  065042  000010          MOV     #RSVTST,@#10    ;SET UP RSVD INSTR. TRAP VECTOR
012734  012737  000340  000012          MOV     #340,@#12
012742  010506                  R0136:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012744  005037  066712                  CLR     @#RSVFLG        ;INITIALIZE TEST FLAG THAT WILL GET
                                                                ;COMPLEMENTED BY TRAP SERVICE
012750  000257                          CCC                     ;SCOPE SYNC

012752  177777                  I0136:  177777                  ;FORCE RSVD INSTR. TRAP

012754  005137  066712                  COM     @#RSVFLG                ;TEST FLAG SHOULD GO TO 000000
012760  001402                          BEQ     A0136           ;BR IF TRAP SPRUNG

012762  000000                  E0136:  HALT                    ;RSVD INSTR. TRAP FAILED
012764  000750                          BR      T0136           ;LOCK ON HARD ERROR

012766  012737  065050  000010  A0136:  MOV     #RSERR,@#10     ;SET UP RSVD INSTR TRAP VECTOR TO POINT
012774  012737  000340  000012          MOV     #340,@#12       ;TO ERROR SERVICE ROUTINE
```

```
                                        ; ***************************************************************************
                                        .SBTTL T0137 BASIC TEST OF BUS TIMEOUT TRAP LINKAGE
                                        ; ***************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          BOSJ2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K4-6 NOSACK(1)L

013002  012700  000137          T0137:  MOV     #0137,R0                ;LOAD R0 WITH TEST NO.
013006  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013014  013701  013046                  MOV     @#I0137,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
013020  010605                          MOV     SP,R5           ;SAVE THE SP
013022  012737  065152  000004          MOV     #BETST,@#4      ;SET UP THE BUS ERROR VECTOR
013030  012737  000340  000006          MOV     #340,@#6
013036  010506                  R0137:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
013040  005037  066714                  CLR     @#BERFLG        ;INITIALIZE TEST FLAG THAT WILL GET
                                                                ;COMPLEMENTED BY TRAP SERVICE
013044  000257                          CCC                     ;SCOPE SYNC

013046  005737  177700          I0137:  TST     @#177700        ;FORCE BUS TIMEOUT USING R0 ADDR.

013052  005137  066714                  COM     @#BERFLG        ;TEST FLAG SHOULD GO TO 000000
013056  001402                          BEQ     T0140           ;BR IF TRAP SPRUNG

013060  000000          E0137:  HALT                            ;BUS ERROR FAILED TO SPRING TRAP
013062  000747                  BR      T0137           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0140 BASIC TEST FOR ACCESSING DL11 REGISTERS
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8
                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016
                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=N / A
                                        ;CODES:         N / A
                                        ;SYNC:          B05J2 (-)
                                        ;KEY SIG:       K3-8 BIT+CMP+TSTH  /  K3-3 DM=2L
013064  012700  000140          T0140:  MOV     #0140,R0                ;LOAD R0 WITH TEST NO.
013070  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013076  005067  054500                  CLR     MBUF0           ;INIT STALL COUNTER
013102  005367  054474          1$:     DEC     MBUF0           ;COUNT THE TIMER
013106  001375                          BNE     1$              ;BR IF NO TIMEOUT
013110  012737  013150  000004          MOV     #E0140,@#4      ;SET UP BUS TIMEOUT VECTOR
013116  012737  000340  000006          MOV     #340,@#6
013124  010605                          MOV     SP,R5           ;SAVE TH SP
013126  010506                  R0140:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
013130  012702  177560                  MOV     #RCSR,R2        ;[R2] = STARTING DL11 ADDR.
013134  000257                          CCC                     ;SCOPE SYNC
                                        
013136  005722                  I0140:  TST     (R2)+           ;REFERENCE DL11 - RCSR
013140  005722                          TST     (R2)+           ;REFERENCE DL11 - RDBR
013142  005722                          TST     (R2)+           ;REFERENCE DL11 - XCSR
013144  005712                          TST     (R2)            ;REFERENCE DL11 - XDBR
                                        
013146  000403                          BR      A0140           ;GO TO NEXT TEST
                                        
013150  005742                  E0140:  TST     -(R2)           ;BAD ADDRESS IN R2
013152  000000                          HALT                    ;ONE OF DL11 ADDR'S CAUSED TIME OUT
013154  000764                          BR      R0140           ;LOCK ON HARD ERROR
                                        
013156  012737  065160  000004  A0140:  MOV     #BERR,@#4       ;SET UP BUS ERROR VECTOR TO POINT
013164  012737  000340  000006          MOV     #340,@#6        ;TO ERROR SERVICE ROUTINE
```

```
                                ; ***************************************************************************
                                        .SBTTL T0141 BASIC TEST OF DL11 - XCSR - READY(1)
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=000000

                                ;CODES:         [367] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)

                                ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(Z)(1)H  /  K3-8 BIT+CMP+TSTH

013172  012700  000141         T0141:  MOV     #0141,R0                ;LOAD R0 WITH TEST NO.
013176  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013204  012702  177564                  MOV     #XCSR,R2        ;DEST ADDR = XCSR
013210  012704  000200                  MOV     #200,R4         ;RESULT S / B = 200
013214  005012                  R0141:  CLR     (R2)            ;CLEAR [DEST]
013216  012701  000000                  MOV     #0,R1           ;SET UP TIMEOUT COUNTER
013222  000257                          CCC                     ;SCOPE SYNC

013224  020412                 I0141:  CMP     R4,(R2)         ;TEST READY BIT - IT SHOULD BE SET

013226  001405                          BEQ     T0142           ;BR IF IT WAS
013230  005301                          DEC     R1              ;TICK-TOCK GOES THE TIMER
013232  001374                          BNE     I0141           ;BR IF NOT A TIMEOUT

013234  011203                          MOV     (R2),R3         ;GET THE WAS DATA
013236  000000                 E0141:  HALT                    ;READY BIT IN XCSR FAILED ON A (0)
013240  000765                          BR      R0141           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0142 BASIC TEST OF DL11 - XCSR - MAINT BIT (0)
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=000000
                                        ;CODES:         [367] SPS=3  /  N:C=0100
                                        ;SYNC:          B05J2 (-)
                                        ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(Z)(1)H  /  K3-8 BIT+CMP+TSTH
013242  012700  000142        T0142:  MOV     #0142,R0                ;LOAD R0 WITH TEST NO.
013246  112760  000377  070162        MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013254  012702  177564                MOV     #XCSR,R2        ;DEST ADDR = XCSR
013260  012704  000200                MOV     #200,R4         ;RESULT S / B = 200
013264  005012                R0142:  CLR     (R2)            ;CLEAR MAINT. BIT
013266  000257                        CCC                     ;SCOPE SYNC
013270  020412                I0142:  CMP     R4,(R2)         ;TEST MAINT(0)
013272  001403                        BEQ     T0143           ;BR IF MAINT BIT CLEAR
013274  011203                        MOV     (R2),R3         ;GET THE WAS DATA
013276  000000                E0142:  HALT                    ;CAN'T CLEAR MAINT BIT
013300  000771                        BR      R0142           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL T0143 BASIC TEST OF DL11 XCSR - MAINT BIT = 1
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
                                        ;EXEC:          [224]SLUC=LLHHL :[367]D=000000
                                        ;CODES:         [367] SPS=3  /  N:C=0100
                                        ;SYNC:          B05J2 (-)
                                        ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(Z)(1)H  /  K3-8 BIT+CMP+TSTH
013302  012700  000143          T0143:  MOV     #0143,R0                ;LOAD R0 WITH TEST NO.
013306  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013314  012702  177564                  MOV     #XCSR,R2        ;DEST ADDR = XCSR
013320  012704  000204                  MOV     #204,R4         ;RESULT S / B = 204
013324  012712  000004          R0143:  MOV     #4,(R2)         ;SET THE MAINT. BIT
013330  000257                          CCC                     ;SCOPE SYNC

013332  020412                  I0143:  CMP     R4,(R2)         ;TEST MAINT.(1)

013334  001403                          BEQ     T0144           ;BR IF IT WAS

013336  011203                          MOV     (R2),R3         ;GET THE WAS DATA
013340  000000          E0143:  HALT                            ;CAN'T SET MAINT BIT IN XCSR
013342  000770                  BR      R0143                   ;LOCK 0 HARD ERROR
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0144 BASIC DL11 OUT / IN ECHO TEST (MAINT MODE)
                                ; ***************************************************************************


                                ;THIS ROUTINE USES THE MAINTENANCE MODE FEATURE OF THE DL11 TO
                                ;TURN AROUND A STRING OF 8 CHARACTERS TO THE DL11. THIS STRING CONSISTS
                                ;OF ALTERNATING NULL / DELETE CHARS WHICH ARE NON PRINTING. THE 8 CHARS
                                ;ARE OUTPUT THEN READ BACK INTO A CORE BUFFER AND THEN THE INPUT AND
                                ;OUTPUT CORE BUFFERS ARE CHECKED FOR EQUIVALENCE. IF AN ERROR IS DET-
                                ;ECTED DURING THE COMPARISON THE ROUTINE HALTS WITH THE WAS AND S / B
                                ;DATA IN R3 AND R4 RESPECTFULLY. A TIMER IS EMPLOYED TO PREVENT THE
                                ;TEST FROM HANGING IF RECEIVER DONE DOES NOT RESPOND.

013344  012700  000144          T0144:  MOV     #0144,R0        ;LOAD R0 WITH TEST NO.
013350  112760  000377  070162          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013356  012702  177560                  MOV     #RCSR,R2        ;R2 POINTS TO DL11 - START ADDR
013362  105762  000002                  TSTB    2(R2)           ;REFERENCE DL11 INPUT DATA BUFFER TWICE
013366  105762  000002                  TSTB    2(R2)           ;TO FLUSH RCVR "DONE" BIT
013372  012703  067556                  MOV     #IBUF,R3        ;R3 POINTS TO CORE INPUT BUFFER
013376  012704  067546                  MOV     #OBUF,R4        ;R4 POINTS TO CORE OUTPUT BUFFER
013402  012705  000010                  MOV     #10,R5          ;R5 WILL COUNT 8 CHARS OUTPUT
013406  012762  000004  000004          MOV     #4,4(R2)        ;TURN ON MAINT MODE

013414  012701  000000          1$:     MOV     #0,R1           ;R1 USED AS TIMEOUT COUNTER
013420  112462  000006                  MOVB    (R4)+,6(R2)     ;LOAD OUTPUT BUFFER IN DL11
013424  105712                  2$:     TSTB    (R2)            ;RECEIVER DONE SET ?
013426  100404                  BMI     3$              ;BR IF YES
013430  005301                  DEC     R1              ;COUNT THE TIMER
013432  001374                  BNE     2$              ;BR IF NO TIMEOUT

013434  000000                  HALT                    ;DL11 FAILED TO RESPOND IN TIME
013436  000742                  BR      T0144           ;LOCK ON HARD ERROR

013440  116223  000002          3$:     MOVB    2(R2),(R3)+     ;READ THE DL11 INPUT BUFFER INTO CORE
013444  005305                  DEC     R5              ;COUNT ONE CHAR
013446  001362                  BNE     1$              ;BR IF NOT DONE 8 CHARS

013450  005062  000004                  CLR     4(R2)           ;TURN OFF MAINT. MODE
013454  012705  000010                  MOV     #10,R5          ;RESET CHAR COUNTER
013460  012703  067556                  MOV     #IBUF,R3        ;RESET INBUF POINTER
013464  012704  067546                  MOV     #OBUF,R4        ;RESET OUTBUF POINTER

013470  122324                  4$:     CMPB    (R3)+,(R4)+     ;INPUT = OUTPUT ??
013472  001003                  BNE     5$              ;BR IF NOT
013474  005305                  DEC     R5              ;COUNT ONE CHECKED
013476  001374                  BNE     4$              ;BR UNTIL 8 DONE
013500  000410                  BR      CITST           ;GO TO NEXT TEST

013502  114303                  5$:     MOVB    -(R3),R3        ;WAS DATA IN R3 [BITS 7:0]
013504  114404                  MOVB    -(R4),R4        ;S / B DATA IN R4 [BITS 7:0]
013506  042703  177400                  BIC     #177400,R3      ;STRIP OFF BITS <15:08>
013512  042704  177400                  BIC     #177400,R4      ;  "             "
013516  000000                  HALT                    ;RECEIVED DATA NOT EQUAL TO OUTPUT DATA
013520  000711                  BR      T0144           ;LOCK ON HARD ERROR
```

DBQEAB.CMB TD144 BASIC DL11 OUT / IN ECHO TEST (MAINT MODE)

```
B008
B009
```

C01


```
8010                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-
8011                                    ;//////////COMPREHENSIVE INSTRUCTION TESTS//////////////////////
8012                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
8013
8014  013522  012737  065266  000020  CITST:  MOV     #SCOPEB,@#20    ;SET UP IOT VECTOR
8015  013530  005037  000022                  CLR     @#22
8016  013534  012737  065406  000030          MOV     #ERRB,@#30      ;SET UP EMT VECTOR
8017  013542  012737  000340  000032          MOV     #340,@#32
8018  013550  012737  066050  000034          MOV     #PRINT,@#34     ;SET UP TRAP VECTOR
8019  013556  012737  000340  000036          MOV     #340,@#36
8020  013564  012737  064706  000024          MOV     #PDWN,@#24      ;SET UP POWER FAIL VECTOR
8021  013572  012737  000340  000026          MOV     #340,@#26
8022  013600  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING INTRO. I.D. MESSAGE
8023  013606  001007                          BNE     1$              ;BR IF YES
8024  013610  005737  066722                  TST     @#ONCE          ;FIRST TIME INTO "CIT" TESTS ?
8025  013614  001004                          BNE     1$              ;BR IF NOT - PRINT ID ONLY ONCE
8026  013616  005137  066722                  COM     @#ONCE          ;SET FLAG TO INHIBIT PRINTING AGAIN
8027  013622  104400                          TYPE                    ;IDENTIFY THIS PROGRAM
8028  013624  067212                          IDENT1                  ;ADDR OF THE ID MESSAGE
8029  013626  004737  066210          1$:     JSR     PC,@#TSTOPT     ;GO TEST FOR 11/40 OPTIONS
8030  013632  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY TO LEVEL 000
8031  013636  012737  013636  066654  2$:     MOV     #2$,@#RETURN    ;INITIALIZE SCOPE LOOP RETURN
8032
```

```
                                ; ***************************************************************
                                        .SBTTL TD145 QUICK VERIFY TEST FOR BMI,BEQ,BVS,BCS-FLG=0
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110   /   16[110]016,016

                                ;EXEC:          N  /  A

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2  (-)  T = 1.5 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-5 BUBC3(BUT37) H

013644  012700  000145          TD145:  MOV     #0145,R0                ;LOAD R0 WITH TEST NO.
013650  013701  013656                  MOV     @#I0145,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
013654  000257                  R0145:  CCC                     ;CLEAR ALL FLAGS

013656  001404                  I0145:  BEQ     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013660  100403                          BMI     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013662  102402                          BVS     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013664  103401                          BCS     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013666  000402                          BR      00145           ;GO CALL SCOPE

013670  104005                  E0145:  ERROR5                  ;ONE OF ABOVE BR'S FAILED
013672  013654                          R0145                   ;ERROR LOOP RETURN

013674  000004                  00145:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0146 QUICK VERIFY TEST FOR BMI,BEQ,BVS,BCS-FLAG=1
                                ; ************************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [341]ALUC=LHLLH :[016]D=#I20146 OR #I30146 OR #I40146 OR #00146 DEPENDEN

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 TRUE BR L   /   K3-5 BUBC3(BUT37) H   /   K3-

013676  012700  000146         T0146:  MOV     #0146,R0                ;LOAD R0 WITH TEST NO.
013702  013701  013710                 MOV     @#I10146,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD

013706  000277                 R0146:  SCC                             ;MAKE N:C = 1111

013710  001402                 I10146: BEQ     I20146                  ;TEST THE BEQ-IT SHOULD BR

013712  104005                 E10146: ERRORS                          ;BEQ FAILED
013714  013706                         R0146                           ;ERROR LOOP RETURN

013716  100402                 I20146: BMI     I30146                  ;TEST THE BMI-IT SHOULD BR

013720  104005                 E20146: ERRORS                          ;BMI FAILED
013722  013706                         R0146                           ;ERROR LOOP RETURN

013724  102402                 I30146: BVS     I40146                  ;TEST THE BVS-IT SHOULD BR

013726  104005                 E30146: ERRORS                          ;BVS FAILED
013730  013706                         R0146                           ;ERROR LOOP RETURN

013732  103402                 I40146: BCS     00146                   ;TEST THE BCS-IT SHOULD BR

013734  104005                 E40146: ERRORS                          ;BCS FAILED
013736  013706                         R0146                           ;ERROR LOOP RETURN

013740  000004                  00146: SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0147 BNE TEST WITH Z=1
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 1.5 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-5 BUBC3(BUT37) H

013742  012700  000147          T0147:  MOV     #0147,R0                ;LOAD R0 WITH TEST NO.
013746  013701  013754                  MOV     @#I0147,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

013752  000264                  R0147:  SEZ                             ;MAKE Z=1

013754  001001                  I0147:  BNE     E0147           ;TEST THE BNE-IT SHOULDN'T BR
013756  000402                          BR      00147           ;GO TO SCOPE EXIT

013760  104005                  E0147:  ERROR5                  ;BNE FAILED
013762  013752                          R0147                   ;ERROR LOOP RETURN

013764  000004                  00147: SCOPE                    ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0150 BNE TEST WITH Z=0
                                        ; ***************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [111,340,341,016] FC 1,7
                                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016
                                        ;EXEC:          [016] D = #00150
                                        ;CODES:         N / A
                                        ;SYNC:          B05J2 (-) T = 1.8 USEC
                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=1L
013766  012700  000150          T0150:  MOV     #0150,R0                ;LOAD R0 WITH TEST NO.
013772  013701  014000                  MOV     @#I0150,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
013776  000244                  R0150:  CLZ                             ;MAKE Z=0
014000  001002                  I0150:  BNE     00150           ;TEST THE BNE-IT SHOULD BR
014002  104005                  E0150:  ERROR5                  ;BNE FAILED
014004  013776                          R0150                   ;ERROR LOOP RETURN
014006  000004                   00150: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
8172                                    ; ***************************************************************
8173                                          .SBTTL T0151 BPL TEST WITH N=1
8174                                    ; ***************************************************************
8175
8176                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8177
8178                                    ;ROM SEQ:       [110,347,016] FC 1,7
8179
8180                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8181
8182                                    ;EXEC:          NO BRANCH
8183
8184                                    ;CODES:         N / A
8185
8186                                    ;SYNC:          B05J2 (-) T= 1.4 USEC
8187
8188                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=0L  /  K3-4 IR15 L
8189
8190  014010  012700  000151           T0151:  MOV     #0151,R0                ;LOAD R0 WITH TEST NO.
8191  014014  013701  014022                   MOV     @#I0151,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8192
8193  014020  000270                   R0151:  SEN                             ;MAKE N=1
8194
8195  014022  100001                   I0151:  BPL     E0151           ;TEST THE BPL-IT SHOULDN'T BR
8196  014024  000402                           BR      00151           ;GO TO SCOPE EXIT
8197
8198  014026  104005                   E0151:  ERROR5                  ;BPL FAILED
8199  014030  014020                           R0151                   ;ERROR LOOP RETURN
8200
8201  014032  000004                    00151: SCOPE                   ;CALL SCOPE LOOP UTILITY
8202
8203
```

```
8204                                ; ***************************************************************
8205                                        .SBTTL T0152 BPL TEST WITH N=0
8206                                ; ***************************************************************
8207
8208                                ;MICROPROGRAMMING   /   LOGIC INFORMATION
8209
8210                                ;ROM SEQ:       [111,340,341,016] FC 1,7
8211
8212                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016
8213
8214                                ;EXEC:          [016] D = #00152
8215
8216                                ;CODES:         N  /  A
8217
8218                                ;SYNC:          B05J2 (-) T = 1.8 USEC
8219
8220                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 FALSE BR L   /   K3-3 SM=0L   /   K3-4 IR15 L
8221
8222  014034  012700  000152       T0152:  MOV     #0152,R0                ;LOAD R0 WITH TEST NO.
8223  014040  013701  014046               MOV     @#I0152,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8224
8225  014044  000250               R0152:  CLN                             ;MAKE N=0
8226
8227  014046  100002               I0152:  BPL     00152           ;TEST THE BPL-IT SHOULD BR
8228
8229  014050  104005               E0152:  ERROR5                  ;BPL FAILED
8230  014052  014044                       R0152                   ;ERROR LOOP RETURN
8231
8232  014054  000004                00152: SCOPE                   ;CALL SCOPE LOOP UTILITY
8233
8234
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0153 BVC TEST WITH V=1
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING   /   LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N  /  A
                                ;
                                ;SYNC:          BOSJ2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=2L   /   K3-4 IR15 L
                                ;
014056  012700  000153          T0153:  MOV     #0153,R0                ;LOAD R0 WITH TEST NO.
014062  013701  014070                  MOV     @#I0153,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
014066  000262                  R0153:  SEV                             ;MAKE V=1
                                ;
014070  102001                  I0153:  BVC     E0153           ;TEST THE BVC-IT SHOULDN'T BR
014072  000402                          BR      00153           ;GO TO SCOPE EXIT
                                ;
014074  104005                  E0153:  ERROR5                  ;BVC FAILED
014076  014066                          R0153                   ;ERROR LOOP RETURN
                                ;
014100  000004                  00153: SCOPE                    ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
                                ; ***************************************************************
                                        .SBTTL T0154 BVC TEST WITH V=0
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [016] D = #00154

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   KK5-3 FALSE BR L   /   K3-3 SM-2L   /   K3-4 IR15


                                ;CODES:         N  /  A
014102  012700  000154          T0154:  MOV     #0154,R0                ;LOAD R0 WITH TEST NO.
014106  013701  014114                  MOV     @#I0154,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014112  000242                  R0154:  CLV                             ;MAKE V=0

014114  102002                  I0154:  BVC     00154           ;TEST THE BVC-IT SHOULD BR

014116  104005                  E0154:  ERROR5                  ;BVC FAILED
014120  014112                          R0154                   ;ERROR LOOP RETURN

014122  000004                  00154:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0155 BCC TEST WITH C=1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

014124  012700  000155         T0155:  MOV     #0155,R0                ;LOAD R0 WITH TEST NO.
014130  013701  014136                 MOV     @#I0155,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014134  000261                  R0155:  SEC                     ;MAKE C=1

014136  103001                  I0155:  BCC     E0155           ;TEST THE BCC, IT SHOULDN'T BR
014140  000402                          BR      00155           ;GO TO SCOPE EXIT

014142  104005                  E0155:  ERROR5                  ;BCC FAILED
014144  014134                          R0155                   ;ERROR LOOP RETURN

014146  000004                  00155:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
8331                                    ; ***************************************************************
8332                                          .SBTTL T0156 BCC TEST WITH C=0
8333                                    ; ***************************************************************
8334
8335                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8336
8337                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
8338
8339                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
8340
8341                                    ;EXEC:          [016] D = #00156
8342
8343                                    ;CODES:         N / A
8344
8345                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8346
8347                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-4 IR15 L
8348
8349
8350  014150  012700  000156           T0156:  MOV     #0156,R0            ;LOAD R0 WITH TEST NO.
8351  014154  013701  014162                   MOV     @#I0156,R1         -;LOAD R1 WITH TEST INSTRUCTION WORD
8352
8353  014160  000241                   R0156:  CLC                         ;MAKE C=0
8354
8355  014162  103002                   I0156:  BCC     00156               ;TEST THE BCC-IT SHOULD BR
8356
8357  014164  104005                   E0156:  ERROR5                      ;BCC FAILED
8358  014166  014160                           R0156                       ;ERROR LOOP RETURN
8359
8360  014170  000004                    00156: SCOPE                       ;CALL SCOPE LOOP UTILITY
8361
8362
```

```
                                ; ***************************************************************
                                        .SBTTL T0157 VERIFY NO BRANCH MICROROUTINE DOES NOT CLR FLAGS
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1111      (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

014172  012700  000157          T0157:  MOV     #0157,R0                ;LOAD R0 WITH TEST NO.
014176  013701  014204                  MOV     @#I0157,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014202  000277                  R0157:  SCC                             ;MAKE N:C = 1111

014204  103007                  I0157:  BCC     E0157                   ;TEST THE BCC-IT SHOULDN'T BR

014206  013702  177776                  MOV     @#PSW,R2                ;GET WAS FLAGS
014212  022702  000017                  CMP     #17,R2                  ;N:C = 1111?
014216  001404                          BEQ     00157                   ;BR IF YES

014220  010237  177776                  MOV     R2,@#PSW                ;RESTORE N:C

014224  104005                  E0157:  ERROR5                          ;NO. BRANCH MICROROUTINE ALTERED CODES
014226  014202                          R0157                           ;ERROR LOOP RETURN

014230  000004                  00157:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
8400                                    ; ***************************************************************************
8401                                          .SBTTL TO160 VERIFY BRANCH MICROROUTINE DOES NOT CLR FLAGS
8402                                    ; ***************************************************************************
8403
8404                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8405
8406                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
8407
8408                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
8409
8410                                    ;EXEC:          [016] D = #A0160
8411
8412                                    ;CODES:         N:C = 1111      (NO CHANGE)
8413
8414                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8415
8416                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR  /  K3-3 SM=0L  /  K3-3 IR(14:12) = 0 L
8417
8418  014232  012700  000160       T0160:  MOV     #0160,R0                ;LOAD R0 WITH TEST NO.
8419  014236  013701  014244               MOV     @#I0160,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8420
8421  014242  000277               R0160:  SCC                             ;MAKE N:C = 1111
8422
8423  014244  000402               I0160:  BR      A0160           ;TEST THE BR
8424
8425  014246  104005               E10160: ERROR5                  ;JUST IN CASE THE BR DIDN'T WORK
8426  014250  014242                       R0160                   ;ERROR LOOP RETURN
8427
8428  014252  013702  177776       A0160:  MOV     @#PSW,R2        ;GET THE FLAGS
8429  014256  022702  000017               CMP     #17,R2          ;N:C = 1111?
8430  014262  001404                       BEQ     00160           ;BR IF YES
8431
8432  014264  010237  177776               MOV     R2,@#PSW        ;RESTORE FLAGS
8433
8434  014270  104005               E20160: ERROR5                  ;BRANCH MICROROUTINE ALTERED CODES
8435  014272  014242                       R0160                   ;ERROR LOOP RETURN
8436
8437  014274  000004               00160:  SCOPE                   ;CALL SCOPE LOOP UTILITY
8438
8439
```

```
8440                                    ; ************************************************************************
8441                                          .SBTTL TD161 VERIFY NO BRANCH MICROROUTINE DOES NOT SET FLAGS
8442                                    ; ************************************************************************
8443
8444                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8445
8446                                    ;ROM SEQ:       [110,347,016] FC 1,7
8447
8448                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8449
8450                                    ;EXEC:          NO BRANCH
8451
8452                                    ;CODES:         N:C = 0000      (NO CHANGE)
8453
8454                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
8455
8456                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L
8457
8458  014276  012700  000161      TD161:  MOV     #D161,R0                ;LOAD R0 WITH TEST NO.
8459  014302  013701  014310              MOV     @#ID161,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8460
8461  014306  000257              RD161:  CCC                             ;MAKE N:C = 0000
8462
8463  014310  103406              ID161:  BCS     ED161           ;TEST THE BCS-IT SHOULDN'T BR
8464
8465  014312  013702  177776              MOV     @#PSW,R2        ;GET FLAGS
8466  014316  005702                      TST     R2              ;N:C = 0000
8467  014320  001404                      BEQ     00161           ;BR IF YES
8468
8469  014322  010237  177776              MOV     R2,@#PSW        ;RESTORE FLAGS
8470
8471  014326  104005              ED161:  ERRORS
8472  014330  014306                      RD161                   ;ERROR LOOP RETURN
8473
8474  014332  000004              00161:  SCOPE                   ;CALL SCOPE LOOP UTILITY
8475
8476
```

```
                                ; ***************************************************************************
                                        .SBTTL T0162 VERIFY BRANCH MICROROUTINE DOES NOT SET FLAGS
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #A0162

                                ;CODES:         N:C = 0000      (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BIT INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=0L  /  K3-4 IR(14:12)=0

014334  012700  000162        T0162:  MOV     #0162,R0                ;LOAD R0 WITH TEST NO.
014340  013701  014346                MOV     @#I0162,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014344  000257                R0162:  CCC                             ;MAKE N:C = 0000

014346  000402                I0162:  BR      A0162           ;TEST THE BR

014350  104005                E10162: ERROR5                  ;JUST IN CASE THE BR DIDN'T WORK
014352  014344                        R0162                   ;ERROR LOOP RETURN

014354  013702  177776        A0162:  MOV     @#PSW,R2        ;GET FLAGS
014360  005702                        TST     R2              ;N:C = 0000
014362  001404                        BEQ     00162           ;BR IF YES

014364  010237  177776                MOV     R2,@#PSW        ;RESTORE FLAGS

014370  104005                E20162: ERROR5                  ;BRANCH MICROROUTINE ALTERED CODES.
014372  014344                        R0162                   ;ERROR LOOP RETURN

014374  000004                 00162: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
8517                                    ; ***************************************************************************
8518                                            .SBTTL TO163 BGE TEST WITH N,V = 00
8519                                    ; ***************************************************************************
8520
8521                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8522
8523                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
8524
8525                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
8526
8527                                    ;EXEC:          [016] D = #00163
8528
8529                                    ;CODES:         N:C = 0000
8530
8531                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8532
8533                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=2L
8534
8535  014376  012700  000163        TO163:  MOV     #0163,R0                ;LOAD R0 WITH TEST NO.
8536  014402  013701  014410                MOV     @#I0163,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8537
8538  014406  000257                RO163:  CCC                             ;MAKE N:C = 0000
8539
8540  014410  002002                I0163:  BGE     00163           ;TEST THE BGE-IT SHOULD BR
8541
8542  014412  104005                E0163:  ERROR5                  ;BGE FAILED
8543  014414  014406                        RO163                   ;ERROR LOOP RETURN
8544
8545  014416  000004                 00163: SCOPE                   ;CALL SCOPE LOOP UTILITY
8546
8547
```

```
8548                                    ; ***************************************************************
8549                                          .SBTTL T0164 BGE TEST WITH N,V = 01
8550                                    ; ***************************************************************
8551
8552                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8553
8554                                    ;ROM SEQ:       [110,347,016] FC 1,7
8555
8556                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8557
8558                                    ;EXEC:          NO BRANCH
8559
8560                                    ;CODES:         N:C = 0010
8561
8562                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
8563
8564                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L  /  K3-3 IR(14:12)=0 L
8565
8566  014420  012700  000164           T0164:  MOV     #0164,R0                ;LOAD R0 WITH TEST NO.
8567  014424  013701  014434                   MOV     @#I0164,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8568
8569  014430  000257                   R0164:  CCC                             ;CLEAR FLAGS
8570  014432  000262                           SEV                             ;MAKE N,V = 01
8571
8572  014434  002001                   I0164:  BGE     E0164           ;TEST THE BGE-IT SHOULDN'T BR
8573  014436  000402                           BR      00164           ;GO TO SCOPE EXIT
8574
8575  014440  104005                   E0164:  ERROR5                  ;BGE FAILED
8576  014442  014430                           R0164                   ;ERROR LOOP RETURN
8577  014444  000004                    00164: SCOPE                   ;CALL SCOPE LOOP UTILITY
8578
```

```
8579                                    ; ***************************************************************************
8580                                            .SBTTL T0165 BGE TEST WITH N,V = 10
8581                                    ; ***************************************************************************
8582
8583                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8584
8585                                    ;ROM SEQ:       [110,347,016] FC 1,7
8586
8587                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8588
8589                                    ;EXEC:          NO BRANCH
8590
8591                                    ;CODES:         N:C = 1000
8592
8593                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
8594
8595                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L
8596
8597  014446  012700  000165           T0165:  MOV     #0165,R0                ;LOAD R0 WITH TEST NO.
8598  014452  013701  014462                   MOV     @#I0165,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8599
8600  014456  000257                   R0165:  CCC                             ;CLEAR FLAGS
8601  014460  000270                           SEN                             ;MAKE N,V = 10
8602
8603  014462  002001                   I0165:  BGE     E0165                   ;TEST THE BGE-IT SHOULDN'T BR
8604  014464  000402                           BR      00165                   ;GO TO SCOPE EXIT
8605
8606  014466  104005                   E0165:  ERROR5                          ;BGE FAILED
8607  014470  014456                           R0165                           ;ERROR LOOP RETURN
8608
8609  014472  000004                    00165: SCOPE                           ;CALL SCOPE LOOP UTILITY
8610
8611
```

```
8612                                    ; ***************************************************************
8613                                            .SBTTL T0166 BGE TEST WITH N,V = 11
8614                                    ; ***************************************************************
8615
8616                                    ;MICROPROGRAMMING   /.  LOGIC INFORMATION
8617
8618                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
8619
8620                                    ;ACT BUTS:      37[004]100,111  /  16[340]016,016
8621
8622                                    ;EXEC:          [016] D = #00166
8623
8624                                    ;CODES:         N:C = 1010
8625
8626                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8627
8628                                    ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 FALSE BR L   /   K3-3 SM=2L   /   K3-3 IR(14:
8629
8630  014474  012700  000166      T0166:  MOV     #0166,R0                ;LOAD R0 WITH TEST NO.
8631  014500  013701  014510              MOV     @#I0166,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8632
8633  014504  000257              R0166:  CCC                     ;CLEAR FLAGS
8634  014506  000272                      272                     ;MAKE N,V = 11
8635
8636  014510  002002              I0166:  BGE     00166           ;TEST THE BGE-IT SHOULD BR
8637
8638  014512  104005              E0166:  ERROR5                  ;BGE FAILED
8639  014514  014504                      R0166                   ;ERROR LOOP RETURN
8640
8641  014516  000004               00166: SCOPE                   ;CALL SCOPE LOOP UTILITY
8642
8643
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0167 BLT TEST WITH N,V = 00
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING   /   LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 0000
                                ;
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=2L
                                ;
014520  012700  000167          T0167:  MOV     #0167,R0                ;LOAD R0 WITH TEST NO.
014524  013701  014532                  MOV     @#I0167,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
014530  000257                  R0167:  CCC                     ;CLEAR FLAGS
                                ;
014532  002401                  I0167:  BLT     E0167           ;TEST THE BLT-IT SHOULDN'T BR
014534  000402                          BR      00167           ;GO TO SCOPE EXIT
                                ;
014536  104005                  E0167:  ERROR5                  ;BLT FAILED
014540  014530                          R0167                   ;ERROR LOOP RETURN
                                ;
014542  000004                  00167:  SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
8676                                    ; ***************************************************************
8677                                          .SBTTL T0170 BLT TEST WITH N,V = 01
8678                                    ; ***************************************************************
8679
8680                                    ;MICROPROGRAMMING   /   LOGIC INFORMATION
8681
8682                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
8683
8684                                    ;ACT BUTS:      37[004]100,111  /  16[340]016,016
8685
8686                                    ;EXEC:          [016] D = #00170
8687
8688                                    ;CODES:         N:C = 0010
8689
8690                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8691
8692                                    ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 TRUE BR L   /   K3-3 SM=2L   /   K3-3 IR(14:1
8693
8694  014544  012700  000170            T0170:  MOV     #0170,R0                ;LOAD R0 WITH TEST NO.
8695  014550  013701  014560                    MOV     @#I0170,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8696
8697  014554  000257                    R0170:  CCC                             ;CLEAR FLAGS
8698  014556  000262                            SEV                             ;MAKE N,V = 01
8699
8700  014560  002402                    I0170:  BLT     00170           ;TEST THE BLT-IT SHOULD BR
8701
8702  014562  104005                    E0170:  ERROR5                  ;BLT FAILED
8703  014564  014554                            R0170                   ;ERROR LOOP RETURN
8704
8705  014566  000004                     00170: SCOPE                   ;CALL SCOPE LOOP UTILITY
8706
8707
```

```
8708                            ; ***************************************************************
8709                                  .SBTTL T0171 BLT TEST WITH N,V = 10
8710                            ; ***************************************************************
8711
8712                            ;MICROPROGRAMMING  /  LOGIC INFORMATION
8713
8714                            ;ROM SEQ:       [111,340,341,016] FC 1,7
8715
8716                            ;ACT BUTS:      37[004]100,111 / 16[340]016,016
8717
8718                            ;EXEC:          [016] D = #00171
8719
8720                            ;CODES:         N:C = 1000
8721
8722                            ;SYNC:          B05J2 (-) T = 1.8 USEC
8723
8724                            ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L  /  K5-3 TRUE L
8725
8726  014570  012700  000171    T0171:  MOV     #0171,R0                ;LOAD R0 WITH TEST NO.
8727  014574  013701  014604            MOV     @#I0171,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8728
8729  014600  000257            R0171:  CCC                             ;CLEAR FLAGS
8730  014602  000270                    SEN                             ;SET N - N,V = 10
8731
8732  014604  002402            I0171:  BLT     00171           ;TEST THE BLT-IT SHOULD BR
8733
8734  014606  104005            E0171:  ERROR5                  ;BLT FAILED
8735  014610  014600                    R0171                   ;ERROR LOOP RETURN
8736
8737  014612  000004             00171: SCOPE                   ;CALL SCOPE LOOP UTILITY
8738
8739
```

```
8740                                    ; ***************************************************************
8741                                          .SBTTL T0172 BLT TEST WITH N,V = 11
8742                                    ; ***************************************************************
8743
8744                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8745
8746                                    ;ROM SEQ:       [110,347,016] FC 1,7
8747
8748                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8749
8750                                    ;EXEC:          NO BRANCH
8751
8752                                    ;CODES:         N:C = 1010
8753
8754                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
8755
8756                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L  /  K3-3 IR(14:12)=0 L
8757
8758  014614  012700  000172           T0172:  MOV     #0172,R0                ;LOAD R0 WITH TEST NO.
8759  014620  013701  014630                   MOV     @#I0172,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8760
8761  014624  000257                   R0172:  CCC                             ;CLEAR FLAGS
8762  014626  000272                           272                             ;MAKE N,V = 11
8763
8764  014630  002401                   I0172:  BLT     E0172           ;TEST THE BLT-IT SHOULDN'T BR
8765  014632  000402                           BR      00172           ;GO TO SCOPE EXIT
8766
8767  014634  104005                   E0172:  ERROR5                  ;BLT FAILED
8768  014636  014624                           R0172                   ;ERROR LOOP RETURN
8769
8770  014640  000004                   00172: SCOPE                    ;CALL SCOPE LOOP UTILITY
8771
8772
```

```
8773                                    ; ***************************************************************
8774                                          .SBTTL T0173 BGT TEST WITH Z = 1 AND N,V = 01
8775                                    ; ***************************************************************
8776
8777                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8778
8779                                    ;ROM SEQ:       [110,347,016] FC 1,7
8780
8781                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
8782
8783                                    ;EXEC:          NO BRANCH
8784
8785                                    ;CODES:         N:C = 0110
8786
8787                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
8788
8789                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L
8790
8791  014642  012700  000173           T0173:  MOV     #0173,R0                ;LOAD R0 WITH TEST NO.
8792  014646  013701  014656                   MOV     @#I0173,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8793
8794  014652  000257                   R0173:  CCC                             ;CLEAR FLAGS
8795  014654  000266                           266                             ;SET Z AND V
8796
8797  014656  003001                   I0173:  BGT     E0173           ;TEST THE BGT-IT SHOULDN'T BR
8798  014660  000402                           BR      00173           ;GO TO SCOPE EXIT
8799
8800  014662  104005                   E0173:  ERROR5                  ;BGT FAILED
8801  014664  014652                           R0173                   ;ERROR LOOP RETURN
8802
8803  014666  000004                    00173: SCOPE                   ;CALL SCOPE LOOP UTILITY
8804
8805
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0174 BGT TEST WITH Z = 0 AND N,V = 01
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 0010
                                ;
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L
                                ;
014670  012700  000174          T0174:  MOV     #0174,R0                ;LOAD R0 WITH TEST NO.
014674  013701  014716                  MOV     @#I0174,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
014700  032737  000010  066642          BIT     #10,@#BPTLOC    ;BREAKPOINT HALT SET ??
014706  001401                          BEQ     .+4             ;BR IF NOT
014710  000000                          HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
014712  000257                  R0174:  CCC                     ;CLEAR FLAGS
014714  000262                          SEV                     ;SET V
                                ;
014716  003001                  I0174:  BGT     E0174           ;TEST THE BGT-IT SHOULD NOT BR
014720  000402                          BR      00174           ;GO TO SCOPE LOOP EXIT
                                ;
014722  104005                  E0174:  ERROR5                  ;BGT FAILED
014724  014712                          R0174                   ;ERROR LOOP RETURN
                                ;
014726  000004                  00174:  SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0175 BGT TEST WITH Z = 1 AND N,V = 00
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 0100
                                ;
                                ;SYNC:          BOSJ2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L
                                ;
014730  012700  000175          T0175:  MOV     #0175,R0                ;LOAD R0 WITH TEST NO.
014734  013701  014744                  MOV     @#I0175,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
014740  000257                  R0175:  CCC                             ;CLEAR FLAGS
014742  000264                          SEZ                             ;SET Z
                                ;
014744  003001                  I0175:  BGT     E0175           ;TEST THE BGT-IT SHOULD NOT BR
014746  000402                          BR      00175           ;GO TO SCOPE LOOP EXIT
                                ;
014750  104005                  E0175:  ERRORS                  ;BGT FAILED
014752  014740                          R0175                   ;ERROR LOOP RETURN
                                ;
014754  000004                   00175: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

C03


```
8873                                    ; ***************************************************************************
8874                                    ;       .SBTTL T0176 BGT TEST WITH Z = 0 AND N,V = 00
8875                                    ; ***************************************************************************
8876
8877                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
8878
8879                                    ;ROM SEQ:       [111,340,347,016] FC 1,7
8880
8881                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
8882
8883                                    ;EXEC:          [016] D = #00176
8884
8885                                    ;CODE           N:C = 0000
8886
8887                                    ;SYNC:          B05J2 (-) T = 1.8 USEC
8888
8889                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0
8890
8891  014756  012700  000176           T0176:  MOV     #0176,R0                ;LOAD R0 WITH TEST NO.
8892  014762  013701  014770                   MOV     @#I0176,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
8893
8894  014766  000257                   R0176:  CCC                             ;CLEAR FLAGS
8895
8896  014770  003002                   I0176:  BGT     00176           ;TEST THE BGT - IT SHOULD BR
8897
8898  014772  104005                   E0176:  ERROR5                  ;BGT FAILED
8899  014774  014766                           R0176                   ;ERROR LOOP RETURN
8900
8901  014776  000004                   00176:  SCOPE                   ;CALL SCOPE LOOP UTILITY
8902
8903
8904
```

```
                                ; ***************************************************************
                                        .SBTTL TO177 BGT TEST WITH Z = 1 AND N,V = 01
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0110

                                ;SYNC:          BOSJ2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015000  012700  000177         TO177:  MOV     #0177,R0                ;LOAD R0 WITH TEST NO.
015004  013701  015014                  MOV     @#I0177,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015010  000257                  RO177:  CCC                     ;CLEAR FLAGS
015012  000266                          266                     ;MAKE N,V = 01 AND Z = 1

015014  003001                  I0177:  BGT     E0177           ;TEST THE BGT-IT SHOULDN'T BR
015016  000402                          BR      00177           ;GO TO SCOPE EXIT

015020  104005                  E0177:  ERROR5                  ;BGT FAILED
015022  015010                          R0177                   ;ERROR LOOP RETURN

015024  000004                  00177: SCOPE                    ;CALL SCOPE LOOP UTILITY
```

```
 8938                                ; ***************************************************************
 8939                                        .SBTTL T0200 BGT TEST WITH Z = 1 AND N,V = 10
 8940                                ; ***************************************************************
 8941
 8942                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
 8943
 8944                                ;ROM SEQ:       [110,347,016] FC 1,7
 8945
 8946                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
 8947
 8948                                ;EXEC:          NO BRANCH
 8949
 8950                                ;CODES:         N:C = 1100
 8951
 8952                                ;SYNC:          B05J2 (-) T = 1.4 USEC
 8953
 8954                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L
 8955
 8956  015026  012700  000200       T0200:  MOV     #0200,R0                ;LOAD R0 WITH TEST NO.
 8957  015032  013701  015042               MOV     @#I0200,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 8958
 8959  015036  000257               R0200:  CCC                             ;CLEAR FLAGS
 8960  015040  000274                       274                             ;MAKE Z = 1 AND N,V = 10
 8961
 8962  015042  003001               I0200:  BGT     E0200                   ;TEST THE BLT-IT SHOULDN'T BR
 8963  015044  000402                       BR      00200                   ;GO TO SCOPE EXIT
 8964
 8965  015046  104005               E0200:  ERROR5                          ;BLT FAILED
 8966  015050  015036                       R0200                           ;ERROR LOOP RETURN
 8967
 8968  015052  000004                00200: SCOPE                           ;CALL SCOPE LOOP UTILITY
 8969
 8970
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0201 BGT TEST WITH Z = 1 AND N,V = 11
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 1110
                                ;
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L
                                ;
015054  012700  000201          T0201:  MOV     #0201,R0                ;LOAD R0 WITH TEST NO.
015060  013701  015070                  MOV     @#I0201,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015064  000257                  R0201:  CCC                             ;CLEAR FLAGS
015066  000276                          276                             ;MAKE Z = 1 AND N,V = 11
                                ;
015070  003001                  I0201:  BGT     E0201                   ;TEST THE BGT-IT SHOULD NOT BR
015072  000402                          BR      00201                   ;GO TO SCOPE EXIT
                                ;
015074  104005                  E0201:  ERROR5                          ;BLT FAILED
015076  015064                          R0201                           ;ERROR LOOP RETURN
                                ;
015100  000004                  00201: SCOPE                            ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL TO202 BGT TEST WITH Z=0 AND N,V=11
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00202

                                ;CODES:         N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0


015102  012700  000202         TO202:  MOV     #0202,R0                ;LOAD R0 WITH TEST NO.
015106  013701  015116                 MOV     @#I0202,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015112  000257                 R0202:  CCC                     ;CLEAR FLAGS
015114  000272                         272                     ;MAKE N:C=1010

015116  003002                 I0202:  BGT     00202           ;TEST THE BGT - IT SHOULD BR

015120  104005                 E0202:  ERROR5                  ;BGT FAILED
015122  015112                         R0202                   ;ERROR LOOP RETURN

015124  000004                 00202:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0203 BLE TEST WITH Z = 0, AND N,V = 00
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015126  012700  000203         T0203:  MOV     #0203,R0                ;LOAD R0 WITH TEST NO.
015132  013701  015140                 MOV     @#I0203,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015136  000257                  R0203:  CCC                             ;CLEAR FLAGS

015140  003401                  I0203:  BLE     E0203           ;TEST THE BLE-IT SHOULDN'T BR
015142  000402                          BR      00203           ;GO TO SCOPE EXIT

015144  104005                  E0203:  ERROR5                  ;BLE FAILED
015146  015136                          R0203                   ;ERROR LOOP RETURN

015150  000004                   00203: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0204 BLE TEST WITH Z = 1 AND N,V = 00
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [111,340,341,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016
                                ;
                                ;EXEC:          [016] D = #00204
                                ;
                                ;CODES:         N:C = 0100
                                ;
                                ;SYNC:          B05J2 (-) T = 1.8 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L
                                ;
015152  012700  000204          T0204:  MOV     #0204,R0                ;LOAD R0 WITH TEST NO.
015156  013701  015166                  MOV     @#I0204,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015162  000257                  R0204:  CCC                             ;CLEAR FLAGS
015164  000264                          SEZ                             ;SET Z = 1
                                ;
015166  003402                  I0204:  BLE     00204           ;TEST THE BLE-IT SHOULD BR
                                ;
015170  104005                  E0204:  ERROR5                  ;BLE FAILED
015172  015162                          R0204                   ;ERROR LOOP RETURN
                                ;
015174  000004                   00204: SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

J03


```
                                ; ***************************************************************
                                ;       .SBTTL T0205 BLE TEST WITH Z = 0 AND N,V = 01
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [111,340,341,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016
                                ;
                                ;EXEC:          [016] D = #00205
                                ;
                                ;CODES:         N:C = 0010
                                ;
                                ;SYNC:          B05J2 (-) T = 1.8 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K5-2 PS(V)(1)H
                                ;
015176  012700  000205          T0205:  MOV     #0205,R0                ;LOAD R0 WITH TEST NO.
015202  013701  015212                  MOV     @#I0205,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015206  000257                  R0205:  CCC                             ;CLEAR FLAGS
015210  000262                          SEV                             ;MAKE Z = 0 AND N,V = 01
                                ;
015212  003402                  I0205:  BLE     00205           ;TEST THE BLE-IT SHOULD BR
                                ;
015214  104005                  E0205:  ERROR5                  ;BLE FAILED
015216  015206                          R0205                   ;ERROR LOOP RETURN
                                ;
015220  000004                   00205: SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
                                ; ***************************************************************
                                        .SBTTL T0206 BLE TEST WITH Z = 0 AND N,V = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00206

                                ;CODES:         N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L
                                ;  K5-2 PS(N)(1)H

015222  012700  000206         T0206:  MOV     #0206,R0                ;LOAD R0 WITH TEST NO.
015226  013701  015236                 MOV     @#I0206,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015232  000257                 R0206:  CCC                     ;CLEAR FLAGS
015234  000270                         SEN                     ;MAKE Z = 0 AND N,V = 10

015236  003402                 I0206:  BLE     00206           ;TEST THE BLE-IT SHOULD BR

015240  104005                 E0206:  ERROR5                  ;BLE FAILED
015242  015232                         R0206                   ;ERROR LOOP RETURN

015244  000004                  00206: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
9165                                    ; ***************************************************************
9166                                    .SBTTL T0207 BLE TEST WITH Z = 0 AND N,V = 11
9167                                    ; ***************************************************************
9168
9169                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
9170
9171                                    ;ROM SEQ:       [110,347,016] FC 1,7
9172
9173                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
9174
9175                                    ;EXEC:          NO BRANCH
9176
9177                                    ;CODES:         N:C = 1010
9178
9179                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
9180
9181                                    ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L
9182
9183  015246  012700  000207           T0207:  MOV     #0207,R0                ;LOAD R0 WITH TEST NO.
9184  015252  013701  015262                   MOV     @#I0207,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
9185
9186  015256  000257                   R0207:  CCC                             ;CLEAR FLAGS
9187  015260  000272                           272                             ;MAKE Z = 0 AND N,V = 11
9188
9189  015262  003401                   I0207:  BLE     E0207           ;TEST THE BLE-IT SHOULDN'T BR
9190  015264  000402                           BR      00207           ;GO TO SCOPE EXIT
9191
9192  015266  104005                   E0207:  ERROR5                  ;BLE FAILED
9193  015270  015256                           R0207                   ;ERROR LOOP RETURN
9194
9195  015272  000004                    00207: SCOPE                   ;CALL SCOPE LOOP UTILITY
9196
9197
```

```
                                ; ***************************************************************
                                        .SBTTL T0210 BHI TEST WITH Z,C = 00
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00210

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L

015274  012700  000210         T0210:  MOV     #0210,R0                ;LOAD R0 WITH TEST NO.
015300  013701  015306                 MOV     @#I0210,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015304  000257                 R0210:  CCC                     ;MAKE Z,C = 00

015306  101002                 I0210:  BHI     00210           ;TEST THE BHI-IT SHOULD BR

015310  104005                 E0210:  ERROR5                  ;BHI FAILED
015312  015304                         R0210                   ;ERROR LOOP RETURN

015314  000004                  00210: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0211 BHI TEST WITH Z,C = 01
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L

015316  012700  000211         T0211:  MOV     #0211,R0                ;LOAD R0 WITH TEST NO.
015322  013701  015332                 MOV     @#I0211,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015326  000257                 R0211:  CCC                     ;CLEAR FLAGS
015330  000261                         SEC                     ;MAKE Z,C = 01

015332  101001                 I0211:  BHI     E0211           ;TEST THE BHI-IT SHOULD NOT BR
015334  000402                         BR      00211           ;GO TO SCOPE EXIT

015336  104005                 E0211:  ERROR5                  ;BHI FAILED
015340  015326                         R0211                   ;ERROR LOOP RETURN

015342  000004                  00211: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0212 BHI TEST WITH Z,C = 10
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING   /   LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 0100
                                ;
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L
                                ;
015344  012700  000212          T0212:  MOV     #0212,R0                ;LOAD R0 WITH TEST NO.
015350  013701  015360                  MOV     @#I0212,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015354  000257                  R0212:  CCC                             ;CLEAR FLAGS
015356  000264                          SEZ                             ;MAKE Z,C = 10
                                ;
015360  101001                  I0212:  BHI     E0212           ;TEST THE BHI-IT SHOULD NOT BR
015362  000402                          BR      00212           ;GO TO SCOPE EXIT
                                ;
015364  104005                  E0212:  ERROR5                  ;BHI FAILED
015366  015354                          R0212                   ;ERROR LOOP RETURN
                                ;
015370  000004                  00212:  SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
```

```
                                ; ************************************************************************
                                        .SBTTL T0213 BHI TEST WITH Z,C = 11
                                ;************************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L

015372  012700  000213        T0213:  MOV     #0213,R0                ;LOAD R0 WITH TEST NO.
015376  013701  015406                MOV     @#I0213,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015402  000257                R0213:  CCC                             ;CLEAR FLAGS
015404  000265                        265                             ;MAKE Z,C = 11

015406  101001                I0213:  BHI     E0213                   ;TEST THE BHI-IT SHOULDN'T BR
015410  000402                        BR      00213                   ;GO TO SCOPE EXIT

015412  104005                E0213:  ERRORS                          ;BHI FAILED
015414  015402                        R0213                           ;ERROR LOOP RETURN

015416  000004                 00213: SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
9327                                    ; ********************************************************************************
9328                                          .SBTTL T0214 BLOS TEST WITH Z,C = 00
9329                                    ; ********************************************************************************
9330
9331                                    ;MICROPROGRAMMING / LOGIC INFORMATION
9332
9333                                    ;ROM SEQ:       [110,347,016] FC 1,7
9334
9335                                    ;ACT BUTS:      37[004]100,110 / 16[110]016,016
9336
9337                                    ;EXEC:          NO BRANCH
9338
9339                                    ;CODES:         N:C = 0000
9340
9341                                    ;SYNC:          B05J2 (-) T = 1.4 USEC
9342
9343                                    ;KEY SIG:       K5-3 BR INSTR H  /  K3-3 SM=3L  /  K3-4 IR15 L
9344
9345  015420  012700  000214           T0214:  MOV     #0214,R0                ;LOAD R0 WITH TEST NO.
9346  015424  013701  015432                   MOV     @#I0214,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
9347
9348  015430  000257                   R0214:  CCC                             ;MAKE Z,C = 00
9349
9350  015432  101401                   I0214:  BLOS    E0214           ;TEST THE BLOS-IT SHOULDN'T BR
9351  015434  000402                           BR      00214           ;GO TO SCOPE EXIT
9352
9353  015436  104005                   E0214:  ERROR5                  ;BLOS FAILED
9354  015440  015430                           R0214                   ;ERROR LOOP RETURN
9355
9356  015442  000004                    00214: SCOPE                   ;CALL SCOPE LOOP UTILITY
9357
9358
```

```
                                ; ************************************************************************
                                ;       .SBTTL T0215 BLOS TEST WITH Z,C = 01
                                ; ************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [111,340,341,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016
                                ;
                                ;EXEC:          [016] D = #00215
                                ;
                                ;CODES:         N:C = 0001
                                ;
                                ;SYNC:          BOSJ2 (-) T = 1.8 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                ;               ;  K5-2 PS(C)(1)L
                                ;
015444  012700  000215          T0215:  MOV     #0215,R0                ;LOAD R0 WITH TEST NO.
015450  013701  015460                  MOV     @#I0215,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015454  000257                  R0215:  CCC                             ;CLEAR FLAGS
015456  000261                          SEC                             ;MAKE Z,C = 01
                                ;
015460  101402                  I0215:  BLOS    00215           ;TEST THE BLOS-IT SHOULD BR
                                ;
015462  104005                  E0215:  ERROR5                  ;BLOS FAILED
015464  015454                          R0215                   ;ERROR LOOP RETURN
                                ;
015466  000004                  00215:  SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
                                ; ***************************************************************
                                        .SBTTL T0216 BLOS TEST WITH Z,C = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00216

                                ;CODES:         N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                                ;  K5-2 PS(Z)(1)L

015470  012700  000216         T0216:  MOV     #0216,R0                ;LOAD R0 WITH TEST NO.
015474  013701  015504                 MOV     @#I0216,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015500  000257                 R0216:  CCC                             ;CLEAR FLAGS
015502  000264                         SEZ                             ;MAKE Z,C = 10

015504  101402                 I0216:  BLOS    00216                   ;TEST THE BLOS-IT SHOULD BR

015506  104005                 E0216:  ERROR5                          ;BLOS FAILED
015510  015500                         R0216                           ;ERROR LOOP RETURN

015512  000004                  00216: SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0217 BLOS TEST WITH Z,C = 11
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00217

                                ;CODES:         N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                ;  K5-2 PS(C)(I)L

015514  012700  000217          T0217:  MOV     #0217,R0                ;LOAD R0 WITH TEST NO.
015520  013701  015530                  MOV     @#I0217,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015524  000257                  R0217:  CCC                     ;CLEAR FLAGS
015526  000265                          265                     ;MAKE Z,C = 11

015530  101402                  I0217:  BLOS    00217           ;TEST THE BLOS-IT SHOULD BR

015532  104005                  E0217:  ERROR5                  ;BLOS FAILED
015534  015524                          R0217                   ;ERROR LOOP RETURN

015536  000004                   00217: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
9457                                    ; ***************************************************************************
9458                                          .SBTTL T0220 BHIS TEST WITH C = 0
9459                                    ; ***************************************************************************
9460
9461                                    ;MICROPROGRAMMING  /  LOGIC INFORMATION
9462
9463                                    ;ROM SEQ:       [111,340,341,016] FC 1,7
9464
9465                                    ;ACT BUTS:      37[004]100,111 / 16[340]016,016
9466
9467                                    ;EXEC:          [016] D = #00220
9468
9469                                    ;CODES:         N:C = 0000
9470
9471                                    ;SYNC:          B05J2 (-)  T = 1.8 USEC
9472
9473                                    ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-4 IR15 L
9474
9475  015540  012700  000220            T0220:  MOV     #0220,R0                ;LOAD R0 WITH TEST NO.
9476  015544  013701  015552                    MOV     @#I0220,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
9477
9478  015550  000257                    R0220:  CCC                             ;CLEAR FLAGS
9479
9480  015552  103002                    I0220:  BHIS    00220           ;TEST THE BHIS-IT SHOULD BR
9481
9482  015554  104000                    E0220:  ERROR                   ;BHIS FAILED
9483  015556  015550                            R0220                   ;ERROR LOOP RETURN
9484
9485  015560  000004                     00220: SCOPE                   ;CALL SCOPE LOOP UTILITY
9486
9487
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0221 BHIS TEST WITH C = 1
                                ; ***************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;
                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016
                                ;
                                ;EXEC:          NO BRANCH
                                ;
                                ;CODES:         N:C = 0001
                                ;
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;
                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L
                                ;
015562  012700  000221          T0221:  MOV     #0221,R0                ;LOAD R0 WITH TEST NO.
015566  013701  015576                  MOV     @#I0221,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
                                ;
015572  000257                  R0221:  CCC                     ;CLEAR FLAGS
015574  000261                          SEC                     ;MAKE C = 1
                                ;
015576  103001                  I0221:  BHIS    E0221           ;TEST THE BHIS-IT SHOULDN'T BR
015600  000402                          BR      00221           ;GO TO SCOPE EXIT
                                ;
015602  104000                  E0221:  ERROR                   ;BHIS FAILED
015604  015572                          R0221                   ;ERROR LOOP RETURN
                                ;
015606  000004                   00221: SCOPE                   ;CALL SCOPE LOOP UTILITY
                                ;
                                ;
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0222 BLO TEST WITH C = 0
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [110,347,016] FC 1,7
                                ;ACT BUTS:      37[004]100,111 / 16[110]016,016
                                ;EXEC:          NO BRANCH
                                ;CODES:         N:C = 0000
                                ;SYNC:          B05J2 (-) T = 1.4 USEC
                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L
015610  012700  000222          T0222:  MOV     #0222,R0                ;LOAD R0 WITH TEST NO.
015614  013701  015622                  MOV     @#I0222,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
015620  000257                  R0222:  CCC                     ;CLEAR FLAGS
015622  103401                  I0222:  BLO     E0222           ;TEST THE BLO-IT SHOULDN'T BR
015624  000402                          BR      00222           ;GO TO SCOPE EXIT
015626  104005                  E0222:  ERROR5                  ;BLO FAILED
015630  015620                          R0222                   ;ERROR LOOP RETURN
015632  000004                  00222:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0223 BLO TEST WITH C = 1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00223

                                ;CODES:         N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K5-2 PS(C)(1)H  /  K3-3 SM=3L
                                                ;  K3-4 IR15 L

015634  012700  000223          T0223:  MOV     #0223,R0                ;LOAD R0 WITH TEST NO.
015640  013701  015650                  MOV     @#I0223,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015644  000257                  R0223:  CCC                     ;CLEAR FLAGS
015646  000261                          SEC                     ;MAKE C = 1

015650  103402                  I0223:  BLO     00223           ;TEST THE BLO-IT SHOULD BR

015652  104005                  E0223:  ERROR5                  ;BLO FAILED
015654  015644                          R0223                   ;ERROR LOOP RETURN

015656  000004                  00223:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                        ;       .SBTTL T0224 SXT MODE 0 TEST WITH N = 0 AND C = 1
                                        ; ***************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [132,360,001] FC 1,8
                                        ;ACT BUTS:      37[004]100,132 / 27[132]000,001
                                        ;EXEC:          [132]ALUC=HLLHH :[360] D = 000000
                                        ;CODES:         [360] SPS=3  /  N:C = 0101
                                        ;SYNC:          B05J2 (-) T = 1 USEC
                                        ;KEY SIG:       K3-3 DM=0L  /  K3-4 ONLAP INSTR H  /  K3-5 SXT L  /  K3-8 ALUM H
015660  012700  000224        T0224:  MOV     #0224,R0                ;LOAD R0 WITH TEST NO.
015664  013701  015706                MOV     @#I0224,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
015670  005004                        CLR     R4              ;RESULT S / B = 0
015672  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
015676  012703  177777        R0224:  MOV     #-1,R3          ;INITAL DEST. OP = 177777
015702  000257                        CCC                     ;CLEAR CODES
015704  000263                        263                     ;N:C = 0011

015706  006703                I0224:  SXT     R3              ;TEST THE SXT

015710  100403                        BMI     E10224
015712  001002                        BNE     E10224          ;DID SXT MAKE N:C = 0101?
015714  102401                        BVS     E10224
015716  103402                        BCS     A0224

015720  104000                E10224: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
015722  015676                        R0224                   ;ERROR LOOP RETURN

015724  005703                A0224:  TST     R3              ;DID RESULT = 0?
015726  001402                        BEQ     00224           ;BR IF IT DID

015730  104000                E20224: ERROR                   ;SXT DELIVERED WRONG RESULT TO R3
015732  015676                        R0224                   ;ERROR LOOP RETURN

015734  000004                 00224: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0225 SXT MODE 0 TEST WITH N = 0 AND C = 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [132,360,001] FC 1,8

                                ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                ;EXEC:          [132]ALUC=HLLHH :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0100

                                ;SYNC:          BOSJ2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-5 SXT L  /  K3-8 ALUM H

015736  012700  000225        T0225:  MOV     #0225,R0                ;LOAD R0 WITH TEST NO.
015742  013701  015762                MOV     @#I0225,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015746  005004                        CLR     R4              ;RESULT S / B = 0
015750  012702  177703                MOV     #177703,R2      ;DEST ADDR = R3
015754  012703  177777        R0225:  MOV     #-1,R3          ;INITIAL DEST OP = 177777
015760  000257                        CCC                     ;CLEAR N:C

015762  006703                I0225:  SXT     R3              ;TEST THE SXT
015764  103002                        BCC     00225           ;BR IF "C" STILL CLEAR

015766  104000                E0225:  ERROR                   ;SXT AFFECTED "C" BIT
015770  015754                        R0225                   ;ERROR LOOP RETURN

015772  000004                00225:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0226 SXT MODE 0 TEST WITH N = 1 AND C = 1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [132,360,001] FC 1,8

                                ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                ;EXEC:          [132]ALUC=LLLHH :[360] D = 177777

                                ;CODES:         [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-5 SXT L  /  K5-2 PS(N)(1)H

015774  012700  000226        T0226:  MOV     #0226,R0                ;LOAD R0 WITH TEST NO.
016000  013701  016020                MOV     @#I0226,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016004  012704  177777                MOV     #-1,R4          ;RESULT S / B = 177777
016010  012703  177703                MOV     #177703,R3      ;DEST ADDR = 177703
016014  005003                R0226:  CLR     R3              ;INITIAL DEST OP = 0
016016  000277                        SCC                     ;MAKE N:C = 1111

016020  006703                I0226:  SXT     R3              ;TEST THE SXT

016022  100003                        BPL     E10226
016024  001402                        BEQ     E10226          ;N:C = 1001?
016026  102401                        BVS     E10226
016030  103402                        BCS     A0226

016032  104000                E10226: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016034  016014                        R0226                   ;ERROR LOOP RETURN

016036  010305                A0226:  MOV     R3,R5           ;GET RESULT
016040  005105                        COM     R5              ;COMPLEMENT IT-SHOULD GO TO 0
016042  001402                        BEQ     00226           ;BR IF RESULT OF SXT = 1

016044  104000                E20226: ERROR                   ;SXT DELIVERED WRONG RESULT.
016046  016014                        R0226                   ;ERROR LOOP RETURN

016050  000004                 00226: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0227 SXT MODE 0 TEST WITH N = 1 AND C = 0
                                ; ************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [132,360,001] FC 1,8
                                ;ACT BUTS:      37[004]100,132 / 27[132]000,001
                                ;EXEC:          [132]ALUC=LLLHH :[360] D = 177777
                                ;CODES:         [360] SPS=3  /  N:C = 1000
                                ;SYNC:          B05J2 (-)  T = 1 USEC
                                ;KEY SIG:       K3-3 DM = OL  /  K3-4 OVLAP INSTR H  /  K3-5 SXT L  /  K5-2 PS(N)(1) H

016052  012700  000227       T0227:  MOV     #0227,R0                ;LOAD R0 WITH TEST NO.
016056  013701  016100               MOV     @#I0227,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016062  012704  177777               MOV     #-1,R4          ;RESULT S / B = 177777
016066  012702  177703               MOV     #177703,R2      ;DEST ADDR = 177703
016072  005003               R0227:  CLR     R3              ;INITIAL DEST OP = 0
016074  000257                       CCC                     ;CLEAR FLAGS
016076  000276                       276                     ;MAKE N:C = 1110

016100  006703               I0227:  SXT     R3              ;TEST THE SXT
016102  103002                       BCC     00227           ;BR IF "C" UNAFFECTED

016104  104000               E0227:  ERROR                   ;SXT SET "C" BIT
016106  016072                       R0227                   ;ERROR LOOP RETURN

016110  000004                00227: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************************
                                        .SBTTL TO230 SXT MODE 1 AND 2 TEST WITH N = 0 AND C = 1
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:(DM1)  [161,266,267,234,367,375,016] FC 1,3,8
                                ;       :(DM2)  [162,260,267,234,367,375,016] FC 1,3,8

                                ;ACT BUTS:(DM1) 37[004]100,161 / 33[266]220,234 / 16[367]016,016
                                ;       :(DM2)  37[004]100,162 / 33[260]220,234 / 16[367]016,016

                                ;EXEC:          [234]ALUC=HLLHH :[367] D = 000000

                                ;CODES:         [367] SPS=3  /  N:C = 0101

                                ;SYNC:          BO5J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K3-8 ALUM H

016112  012700  000230         TO230:  MOV     #0230,R0                ;LOAD R0 WITH TEST NO.
016116  013701  016140                 MOV     @#I10230,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD

016122  012702  067602                 MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016126  005004                         CLR     R4              ;RESULT S / B = 0
016130  012712  177777         R10230: MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016134  000257                         CCC                     ;CLEAR CODES
016136  000263                         263                     ;MAKE N:C = 0011

016140  006712                 I10230: SXT     (R2)            ;TEST THE SXT - DM1

016142  100403                         BMI     E10230
016144  001002                         BNE     E10230          ;N:C = 0101
016146  102401                         BVS     E10230
016150  103402                         BCS     A0230

016152  104000                 E10230: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016154  016130                         R10230                  ;ERROR LOOP RETURN

016156  005712                 A0230:  TST     (R2)            ;DID RESULT = 0?
016160  001402                         BEQ     R20230          ;BR IF YES

016162  104000                 E20230: ERROR                   ;SXT SHOULD HAVE ZEROED [DEST]
016164  016130                         R10230                  ;ERROR LOOP RETURN

016166  012702  067602         R20230: MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
016172  013701  016206                 MOV     @#I20230,R1     ;LOAD R1 WITH TEST INSTR WORD
016176  012712  177777                 MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016202  000257                         CCC                     ;CLEAR CODES
016204  000263                         263                     ;MAKE N:C = 0011

016206  006722                 I20230: SXT     (R2)+           ;TEST SXT - DM2

016210  100403                         BMI     E30230          ;N:C = 0101 ?
016212  001002                         BNE     E30230
016214  102401                         BVS     E30230
```

```
 9803  016216  103402                          BCS     B0230
 9804
 9805  016220  104000                E30230:   ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
 9806  016222  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS
 9807
 9808  016224  005737  067602        B0230:    TST     @#MBUF0         ;DID RESULT GET ZEROED ?
 9809  016230  001402                          BEQ     C0230           ;BR IF YES
 9810
 9811  016232  104000                E40230:   ERROR                   ;SXT FAILED TO ZERO [DEST]
 9812  016234  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS
 9813
 9814  016236  020227  067604        C0230:    CMP     R2,#MBUF0+2     ;WAS IT REALLY MODE 2 ?
 9815  016242  001402                          BEQ     00230           ;BR IF YES
 9816
 9817  016244  104000                E50230:   ERROR                   ;SXT FAILED TO AUTO INCREMENT
 9818  016246  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS
 9819
 9820  016250  000004                 00230:   SCOPE                   ;CALL SCOPE LOOP UTILITY
 9821
 9822
```

```
                                ; ***************************************************************
                                        .SBTTL T0231 SXT MODE 1 TEST WITH N = 0 AND C = 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016

                                ;EXEC:          [234]ALUC=HLLHH :[367] D = 000000

                                ;CODES:         [367] SPS=3  /  N:C = 0100

                                ;SYNC:          BOSJ2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K3-8 ALUM H

016252  012700  000231       T0231:  MOV     #0231,R0                ;LOAD R0 WITH TEST NO.
016256  013701  016276               MOV     @#I0231,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016262  005004                       CLR     R4              ;RESULT S / B = 0
016264  012702  067602               MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016270  012712  177777       R0231:  MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016274  000257                       CCC                     ;CLEAR "C" BIT

016276  006712               I0231:  SXT     (R2)            ;TEST THE SXT
016300  103002                       BCC     00231           ;BR IF "C" UNDISTURBED

016302  104000               E0231:  ERROR                   ;SXT SET THE "C" BIT
016304  016270                       R0231                   ;ERROR LOOP RETURN

016306  000004                00231: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************************
                                        .SBTTL T0232 SXT MODE 1 TEST WITH N = 1 AND C = 1
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016

                                ;EXEC:          [234]ALUC=LLLHH :[367] D = 177777

                                ;CODES:         [367] SPS=3  /  N:C =1001

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K5-2 PS(N)(1)H

016310  012700  000232         T0232:  MOV     #0232,R0                ;LOAD R0 WITH TEST NO.
016314  013701  016334                 MOV     @#I0232,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016320  012704  177777                 MOV     #-1,R4          ;RESULT S / B = 177777
016324  012702  067602                 MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016330  005012                 R0232:  CLR     (R2)            ;INITIAL [DEST] = 0
016332  000277                         SCC                     ;MAKE N:C = 1111

016334  006712                 I0232:  SXT     (R2)            ;TEST THE SXT

016336  100003                         BPL     E10232
016340  001402                         BEQ     E10232          ;N:C = 1001?
016342  102401                         BVS     E10232
016344  103402                         BCS     A0232

016346  104000                 E10232: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016350  016330                         R0232                   ;ERROR LOOP RETURN

016352  021204                 A0232:  CMP     (R2),R4         ;RESULT = 177777?
016354  001402                         BEQ     00232           ;BR IF YES

016356  104000                 E20232: ERROR                   ;SXT DELIVERED WRONG RESULT
016360  016330                         R0232                   ;ERROR LOOP RETURN

016362  000004                  00232: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
 9903                                ; ***************************************************************************
 9904                                        .SBTTL TO233 SXT MODE 1 TEST WITH N = 1 AND C = 0
 9905                                ; ***************************************************************************
 9906
 9907                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
 9908
 9909                                ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8
 9910
 9911                                ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016
 9912
 9913                                ;EXEC:          [234]ALUC=LLLHH :[367] D = 177777
 9914
 9915                                ;CODES:         [367] SPS=3  /  N:C = 1000
 9916
 9917                                ;SYNC:          BOSJ2 (-) T = 2.5 USEC
 9918
 9919                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K5-2 PS(N)(1)H
 9920
 9921  016364  012700  000233       TO233:  MOV     #0233,R0                ;LOAD R0 WITH TEST NO.
 9922  016370  013701  016412               MOV     @#I0233,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 9923
 9924  016374  012704  177777               MOV     #-1,R4          ;RESULT S / B = 177777
 9925  016400  012702  067602               MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
 9926  016404  005012               R0233:  CLR     (R2)            ;INITIAL [DEST] = 0
 9927  016406  000257                       CCC                     ;CLEAR FLAGS
 9928  016410  000276                       276                     ;MAKE N:C = 1110
 9929
 9930  016412  006712               I0233:  SXT     (R2)            ;TEST THE SXT
 9931  016414  103002                       BCC     00233           ;BR IF "C" UNAFFECTED
 9932
 9933  016416  104000               E0233:  ERROR                   ;SXT SET THE "C" BIT
 9934  016420  016404                       R0233                   ;ERROR LOOP RETURN
 9935
 9936  016422  000004                00233: SCOPE                   ;CALL SCOPE LOOP UTILITY
 9937
 9938
```

```
 9939                                   ; ***************************************************************************
 9940                                          .SBTTL T0234 SWAB MODE 0 TEST WITH POS. RESULT
 9941                                   ; ***************************************************************************
 9942
 9943                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
 9944
 9945                                   ;ROM SEQ:        [134,135,360,001] FC 1,7,8
 9946
 9947                                   ;ACT BUTS:       37[004]100,134 / 27[135]000,001
 9948
 9949                                   ;EXEC:           [135]ALUC=HHLHL :[360] D = 177400
 9950
 9951                                   ;CODES:          [360] SPS=3  /  N:C = 0100
 9952
 9953                                   ;SYNC:           B05J2 (-) T = 1 USEC
 9954
 9955                                   ;KEY SIG:        K2-5 SBML1 (1) H  /  K2-5 SMBL0 (1) L  /  K2-5 SBMH1 (1) H
 9956                                   ;  /  K2-5 SBMH0 (1) L  /  K3-3 DM=0L  /  K3-5 SWAB H  /  K3-4 OVLAP INS
 9957
 9958  016424  012700  000234          T0234:  MOV     #0234,R0                ;LOAD R0 WITH TEST NO.
 9959  016430  013701  016466                  MOV     @#I0234,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 9960
 9961  016434  032737  000020  066642          BIT     #20,@#BPTLOC    ;BREAKPOINT HALT SET ??
 9962  016442  001401                          BEQ     .+4             ;BR IF NOT
 9963  016444  000000                          HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
 9964  016446  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
 9965  016452  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
 9966  016456  012703  000377          R0234:  MOV     #377,R3         ;INITIAL DEST OP = 377
 9967  016462  000257                          CCC                     ;CLEAR FLAGS
 9968  016464  000273                          273                     ;MAKE N:C = 1011
 9969
 9970  016466  000303                  I0234:  SWAB    R3              ;TEST THE SWAB
 9971
 9972  016470  100403                          BMI     E10234
 9973  016472  001002                          BNE     E10234          ;N:C = 0100
 9974  016474  102401                          BVS     E10234
 9975  016476  103002                          BCC     A0234
 9976
 9977  016500  104000                  E10234: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
 9978  016502  016456                          R0234                   ;ERROR LOOP RETURN
 9979
 9980  016504  020403                  A0234:  CMP     R4,R3           ;CORRECT RESULT?
 9981  016506  001402                          BEQ     00234           ;BR IF YES
 9982
 9983  016510  104000                  E20234: ERROR                   ;SWAB DELIVERED WRONG RESULT
 9984  016512  016456                          R0234                   ;ERROR LOOP RETURN
 9985
 9986  016514  000004                   00234: SCOPE                   ;CALL SCOPE LOOP UTILITY
 9987
 9988
```

```
 9989                                ; ***************************************************************
 9990                                        .SBTTL T0235 SWAB MODE 0 TEST WITH NEG. RESULT
 9991                                ; ***************************************************************
 9992
 9993                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
 9994
 9995                                ;ROM SEQ:       [134,135,360,001] FC 1,7,8
 9996
 9997                                ;ACT BUTS:      37[004]100,134 / 27[135]000,001
 9998
 9999                                ;EXEC:          [135]ALUC=HHLHL :[360] D = 000377
10000
10001                               ;CODES:         [360] SPS=3   /   N:C = 1000
10002
10003                               ;SYNC:          B05J2 (-) T = 1 USEC
10004
10005                               ;KEY SIG:       K2-5 SBML1 (1) H   /   K2-5 SBML0 (1) L   /   K2-5 SBMH1 (1) H
10006                               ;   /   K2-5 SBMH0 (1) L   /   K3-3 DM=0L   /   K3-5 SWAB H   /   K3-4 0
10007
10008  016516  012700  000235       T0235:  MOV     #0235,R0                ;LOAD R0 WITH TEST NO.
10009  016522  013701  016546               MOV     @#I0235,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10010
10011  016526  012704  000377               MOV     #377,R4         ;RESULT S  /  B = 377
10012  016532  012702  177703               MOV     #177703,R2      ;DEST ADDR = 177703
10013  016536  012703  177400       R0235:  MOV     #177400,R3      ;INITIAL DEST OP = 177400
10014  016542  000257                       CCC                     ;CLEAR FLAGS
10015  016544  000267                       267                     ;MAKE N:C = 0111
10016
10017  016546  000303               I0235:  SWAB    R3              ;TEST THE SWAB
10018
10019  016550  100003                       BPL     E10235
10020  016552  001402                       BEQ     E10235          ;DID SWAB MAKE N:C = 1000
10021  016554  102401                       BVS     E10235
10022  016556  103002                       BCC     A0235
10023
10024  016560  104000               E10235: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
10025  016562  016536                       R0235                   ;ERROR LOOP RETURN
10026
10027  016564  020403               A0235:  CMP     R4,R3           ;DID SWAB DELIVER CORRECT RESULT?
10028  016566  001402                       BEQ     00235           ;BR IF OK
10029
10030  016570  104000               E20235: ERROR                   ;SWAB DELIVERED WRONG RESULT
10031  016572  016536                       R0235                   ;ERROR LOOP RETURN
10032
10033  016574  000004                00235: SCOPE                   ;CALL SCOPE LOOP UTILITY
10034
10035
```

```
10036                                   ; ****************************************************************
10037                                          .SBTTL T0236 SWAB MODE 1 AND 2 TEST WITH POS. RESULT
10038                                   ; ****************************************************************
10039
10040                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
10041
10042                                   ;ROM SEQ:(DM1)  [161,266,267,236,367,375,016] FC 1,3,9,8
10043                                   ;       :(DM2)  [162,260,267,236,367,375,016] FC 1,3,9,8
10044
10045                                   ;ACT BUTS:(DM1) 37[004]100,161  /  33[266]220,236  /  16[367]016,016
10046                                   ;         (DM2) 37[004]100,162  /  33[260]220,236  /  16[367]016,016
10047
10048                                   ;EXEC:          [236]ALUC=HHLHL :[367] D = 177400
10049
10050                                   ;CODES:         [367] SPS=3   /   N:C = 0100
10051
10052                                   ;SYNC:          B05J2 (-) T = 2 USEC
10053
10054                                   ;KEY SIG:       K2-5 SBML1 (1) H   /   K2-5 SBML0 (1) L   /   K2-5 SBMH1 (1) H   /   K2-
10055                                   ;   K3-3 DM=1L   /   K3-5 SWAB H
10056
10057  016576  012700  000236           T0236:  MOV     #0236,R0                ;LOAD R0 WITH TEST NO.
10058  016602  013701  016626                   MOV     @#I10236,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD
10059
10060  016606  012704  177400                   MOV     #177400,R4      ;RESULT S  /  B = 177400
10061  016612  012702  067602                   MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10062  016616  012712  000377           R10236: MOV     #377,(R2)       ;SET UP DEST OP = 377
10063  016622  000257                           CCC                     ;CLEAR FLAGS
10064  016624  000273                           273                     ;MAKE N:C = 1011
10065
10066  016626  000312                   I10236: SWAB    (R2)            ;TEST THE SWAB - DM1
10067
10068  016630  100403                           BMI     E10236
10069  016632  001002                           BNE     E10236          ;N:C = 0100
10070  016634  102401                           BVS     E10236
10071  016636  103002                           BCC     A0236
10072
10073  016640  104000                   E10236: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
10074  016642  016616                           R10236                  ;ERROR LOOP RETURN
10075
10076  016644  020412                   A0236:  CMP     R4,(R2)         ;CORRECT RESULT?
10077  016646  001402                           BEQ     R20236          ;BR IF OK
10078
10079  016650  104000                   E20236: ERROR                   ;SWAB DELIVERED WRONG RESULT
10080  016652  016616                           R10236                  ;ERROR LOOP RETURN
10081
10082  016654  013701  016674           R20236: MOV     @#I20236,R1     ;LOAD R1 WITH TEST INSTR. WORD
10083  016660  012702  067602                   MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10084  016664  012712  000377                   MOV     #377,(R2)       ;[DEST] = 000377
10085  016670  000257                           CCC                     ;CLEAR FLAGS
10086  016672  000273                           273                     ;MAKE N:C = 1011
10087
10088  016674  000322                   I20236: SWAB    (R2)+           ;TEST THE SWAB - DM2
10089
10090  016676  100403                           BMI     E30236
10091  016700  001002                           BNE     E30236          ;N:C = 0100
```

```
 10092  016702  102401                          BVS     E30236
 10093  016704  103002                          BCC     B0236
 10094
 10095  016706  104000              E30236:     ERROR                   ;SWAB FAILED TO SET CODES PROPERLY
 10096  016710  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS
 10097
 10098  016712  020437  067602      B0236:     CMP     R4,@#MBUF0      ;CORRECT RESULT ?
 10099  016716  001402                          BEQ     C0236           ;BR IF YES
 10100
 10101  016720  104000              E40236:     ERROR                   ;SWAB DELIVERED THE WRONG RESULT
 10102  016722  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS
 10103
 10104  016724  020227  067604      C0236:     CMP     R2,#MBUF0+2     ;DID AUTO INCREMENT OCCUR ?
 10105  016730  001402                          BEQ     00236           ;BR IF YES
 10106
 10107  016732  104000              E50236:     ERROR                   ;SWAB FAILED TO AUTO INC REG.
 10108  016734  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS
 10109
 10110  016736  000004               00236:     SCOPE                   ;CALL SCOPE LOOP UTILITY
 10111
 10112
```

```
10113                                   ; ***************************************************************
10114                                           .SBTTL T0237 SWAB MODE 1 TEST WITH NEG. RESULT
10115                                   ; ***************************************************************
10116
10117                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10118
10119                                   ;ROM SEQ:       [161,266,267,236,367,375,016] FC 1,3,9,8
10120
10121                                   ;ACT BUTS:      37[004]100,134 / 33[266]220,236 / 16[367]016,016
10122
10123                                   ;EXEC:          [236]ALUC=HHLHL :[367] D = 000377
10124
10125                                   ;CODES:         [367] SPS=3  /  N:C = 1000
10126
10127                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
10128
10129                                   ;KEY SIG:       K2-5 SBML1 (1) H  /  K2-5 SBMLO (1) L  /  K2-5 SBMH2 (1) H  /  K2-5 SBMH
10130                                                   ;  K3-3 DM=1L  /  K3-5 SWAB H
10131
10132  016740  012700  000237          T0237:  MOV     #0237,R0                ;LOAD R0 WITH TEST NO.
10133  016744  013701  016770                  MOV     @#I0237,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10134
10135  016750  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
10136  016754  012702  067602                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10137  016760  012712  177400          R0237:  MOV     #177400,(R2)    ;SET UP DEST. OP = 177400
10138  016764  000257                          CCC                     ;CLEAR FLAGS
10139  016766  000267                          267                     ;MAKE N:C = 0111
10140
10141  016770  000312                  I0237:  SWAB    (R2)            ;TEST THE SWAB
10142
10143  016772  100003                          BPL     E10237
10144  016774  001402                          BEQ     E10237          ;N:C = 1000?
10145  016776  102401                          BVS     E10237
10146  017000  103002                          BCC     A0237
10147
10148  017002  104000                  E10237: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
10149  017004  016760                          R0237                   ;ERROR LOOP RETURN
10150
10151  017006  020412                  A0237:  CMP     R4,(R2)         ;CORRECT RESULT?
10152  017010  001402                          BEQ     00237           ;BR IF YES
10153
10154  017012  104000                  E20237: ERROR                   ;SWAB DELIVERED WRONG RESULT
10155  017014  016760                          R0237                   ;ERROR LOOP RETURN
10156
10157  017016  000004                  00237:  SCOPE                   ;CALL SCOPE LOOP UTILITY
10158
10159
```

```
10160                                   ; ***************************************************************
10161                                          .SBTTL T0240 NEG MODE 0 TEST : [DEST] = 0
10162                                   ; ***************************************************************
10163
10164                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10165
10166                                   ;ROM SEQ:       [105,372,360,001] FC 1,7,8
10167
10168                                   ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001
10169
10170                                   ;EXEC:          [372]ALUC=LLHHL :[360] D = 000000
10171
10172                                   ;CODES:         [360] SPS=3  /  N:C = 0100
10173
10174                                   ;SYNC:          B05J2 (-) T = 1 USEC
10175
10176                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H
10177
10178  017020  012700  000240          T0240:  MOV     #0240,R0                ;LOAD R0 WITH TEST NO.
10179  017024  013701  017044                  MOV     @#I0240,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10180
10181  017030  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
10182  017034  005004                          CLR     R4              ;RESULT S / B = 0
10183  017036  005003                  R0240:  CLR     R3              ;INITIAL [DEST] = 0
10184  017040  000257                          CCC                     ;CLEAR FLAGS
10185  017042  000273                          273                     ;MAKE N:C = 1011
10186
10187  017044  005403                  I0240:  NEG     R3              ;TEST THE NEG
10188
10189  017046  100403                          BMI     E10240
10190  017050  001002                          BNE     E10240          ;N:C = 0100 ONLY "Z" SET?
10191  017052  102401                          BVS     E10240
10192  017054  103002                          BCC     A0240
10193
10194  017056  104000                  E10240: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
10195  017060  017036                          R0240                   ;ERROR LOOP RETURN
10196
10197  017062  020304                  A0240:  CMP     R3,R4           ;WAS RESULT = 0
10198  017064  001402                          BEQ     00240           ;BR IF YES
10199
10200  017066  104000                  E20240: ERROR                   ;NEG DELIVERED WRONG RESULT
10201  017070  017036                          R0240                   ;ERROR LOOP RETURN
10202
10203  017072  000004                  00240:  SCOPE                   ;CALL SCOPE LOOP UTILITY
10204
10205
```

```
10206                                   ; ***************************************************************
10207                                           .SBTTL T0241 NEG MODE 0 TEST : [DEST] > 0
10208                                   ; ***************************************************************
10209
10210                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10211
10212                                   ;ROM SEQ:       [105,372,360,001] FC 1,7,8
10213
10214                                   ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001
10215
10216                                   ;EXEC:          [372]ALUC=LLHHL :[360] D = 177776
10217
10218                                   ;CODES:         [360] SPS=3  /  N:C = 1001
10219
10220                                   ;SYNC:          B05J2 (-) T = 1 USEC
10221
10222                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H
10223
10224  017074  012700  000241          T0241:  MOV     #0241,R0                ;LOAD R0 WITH TEST NO.
10225  017100  013701  017124                  MOV     @#I0241,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10226
10227  017104  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
10228  017110  012704  177776                  MOV     #-2,R4          ;RESULT S / B = 177776
10229  017114  012703  000002          R0241:  MOV     #2,R3           ;INITIAL [DEST] = 2
10230  017120  000257                          CCC                     ;CLEAR FLAGS
10231  017122  000266                          266                     ;MAKE N:C = 0110
10232
10233  017124  005403                  I0241:  NEG     R3              ;TEST THE NEG
10234
10235  017126  100003                          BPL     E10241
10236  017130  001402                          BEQ     E10241          ;DID N:C = 1001?
10237  017132  102401                          BVS     E10241
10238  017134  103402                          BCS     A0241
10239
10240  017136  104000          E10241: ERROR                           ;NEGATE FAILED TO ALTER CODES PROPERLY
10241  017140  017114                  R0241                           ;ERROR LOOP RETURN
10242
10243  017142  020304          A0241:  CMP     R3,R4           ;CORRECT RESULT?
10244  017144  001402                  BEQ     00241           ;BR IF YES
10245
10246  017146  104000          E20241: ERROR                           ;NEG DELIVERED WRONG RESULT
10247  017150  017114                  R0241                           ;ERROR LOOP RETURN
10248
10249  017152  000004           00241: SCOPE                           ;CALL SCOPE LOOP UTILITY
10250
10251
```

```
10252                                   ; ***************************************************************************
10253                                           .SBTTL T0242 NEG MODE 0 TEST : [DEST] < 0
10254                                   ; ***************************************************************************
10255
10256                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10257
10258                                   ;ROM SEQ:       [105,372,360,001] FC 1,7,8
10259
10260                                   ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001
10261
10262                                   ;EXEC:          [372]ALUC=LLHHL :[360] D = 000002
10263
10264                                   ;CODES:         [360] SPS=3  /  N:C = 0001
10265
10266                                   ;SYNC:          B05J2 (-) T = 1 USEC
10267
10268                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H
10269
10270  017154  012700  000242          T0242:  MOV     #0242,R0                ;LOAD R0 WITH TEST NO.
10271  017160  013701  017204                  MOV     @#I0242,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10272
10273  017164  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
10274  017170  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
10275  017174  012703  177776          R0242:  MOV     #-2,R3          ;INITIAL [DEST] = 177776
10276  017200  000257                          CCC                     ;CLEAR FLAGS
10277  017202  000276                          276                     ;MAKE N:C = 1110
10278
10279  017204  005403                  I0242:  NEG     R3              ;TEST THE NEG
10280
10281  017206  100403                          BMI     E10242
10282  017210  001402                          BEQ     E10242          ;N:C = 0001?
10283  017212  102401                          BVS     E10242
10284  017214  103402                          BCS     A0242
10285
10286  017216  104000                  E10242: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
10287  017220  017174                          R0242                   ;ERROR LOOP RETURN
10288
10289  017222  020304                  A0242:  CMP     R3,R4           ;RESULT = 2?
10290  017224  001402                          BEQ     00242           ;BR IF YES
10291
10292  017226  104000                  E20242: ERROR                   ;NEG DELIVERED WRONG RESULT
10293  017230  017174                          R0242                   ;ERROR LOOP RETURN
10294
10295  017232  000004                   00242: SCOPE                   ;CALL SCOPE LOOP UTILITY
10296
10297
```

```
                                        ; ************************************************************************
                                        ;       .SBTTL T0243 NEG MODE 0 TEST : [DEST] = 100000 (8)
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [105,372,360,001] FC 1,7,8
                                        ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001
                                        ;EXEC:          [372]ALUC=LLHHL :[360] D = 100000
                                        ;CODES:         [360] SPS=3  /  N:C = 1011
                                        ;SYNC:          B05J2 (-) T = 1 USEC
                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H

017234  012700  000243        T0243:  MOV     #0243,R0                ;LOAD R0 WITH TEST NO.
017240  013701  017262                MOV     @#I0243,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017244  012702  177703                MOV     #177703,R2      ;DEST ADDR = 177703
017250  012704  100000                MOV     #100000,R4      ;RESULT S / B = 100000
017254  010403        R0243:  MOV     R4,R3           ;INITIAL [DEST] = 100000
017256  000257                CCC                     ;CLEAR FLAGS
017260  000264                SEZ                     ;MAKE N:C = 01000

017262  005403        I0243:  NEG     R3              ;TEST THE NEG

017264  100003                BPL     E10243
017266  001402                BEQ     E10243          ;N:C = 1011?
017270  102001                BVC     E10243
017272  103402                BCS     A0243

017274  104000        E10243: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017276  017254                R0243                   ;ERROR LOOP RETURN

017300  020304        A0243:  CMP     R3,R4           ;RESULT STILL 100000?
017302  001402                BEQ     00243           ;BR IF YES

017304  104000        E20243: ERROR                   ;NEG DELIVERED WRONG RESULT
017306  017254                R0243                   ;ERROR LOOP RETURN

017310  000004         00243: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
10344                                   ; ***************************************************************************
10345                                          .SBTTL T0244 NEG MODE 1 TEST : [DEST] = 0
10346                                   ; ***************************************************************************
10347
10348                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10349
10350                                   ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8
10351
10352                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016
10353
10354                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 000000
10355
10356                                   ;CODES:         [367] SPS=3  /  N:C = 0100
10357
10358                                   ;SYNC:          B05J2 (-) T = 2 USEC
10359
10360                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L
10361
10362  017312  012700  000244          T0244:  MOV     #0244,R0                ;LOAD R0 WITH TEST NO.
10363  017316  013701  017336                  MOV     @#I0244,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10364
10365  017322  012702  067602                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10366  017326  005004                          CLR     R4              ;RESULT S / B = 0
10367  017330  005012          R0244:  CLR     (R2)            ;INITIAL [DEST] = 0
10368  017332  000257                          CCC                     ;CLEAR FLAGS
10369  017334  000273                          273                     ;MAKE N:C = 1011
10370
10371  017336  005412          I0244:  NEG     (R2)            ;TEST THE NEG
10372
10373  017340  100403                          BMI     E10244
10374  017342  001002                          BNE     E10244          ;N:C = 0100?
10375  017344  102401                          BVS     E10244
10376  017346  103002                          BCC     A0244
10377
10378  017350  104000          E10244: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
10379  017352  017330                          R0244           ;ERROR LOOP RETURN
10380
10381  017354  021204          A0244:  CMP     (R2),R4         ;RESULT = 0?
10382  017356  001402                          BEQ     00244           ;BR IF YES
10383
10384  017360  104000          E20244: ERROR                   ;NEG DELIVERED WRONG RESULT
10385  017362  017330                          R0244           ;ERROR LOOP RETURN
10386
10387  017364  000004           00244: SCOPE                   ;CALL SCOPE LOOP UTILITY
10388
10389
```

```
                                ; ***************************************************************************
                                        .SBTTL T0245 NEG MODE 1  TEST : [DEST] > 0
                                ; ***************************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8
                                ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016
                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 177776
                                ;CODES:         [367] SPS=3  /  N:C = 1001
                                ;SYNC:          B05J2 (-)  T = 2 USEC
                                ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=1L  /  K3-4 NEG L
017366  012700  000245         T0245:  MOV     #0245,R0                ;LOAD R0 WITH TEST NO.
017372  013701  017416                 MOV     @#I0245,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
017376  012702  067602                 MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
017402  012704  177776                 MOV     #-2,R4          ;RESULT S / B = 177776
017406  012712  000002         R0245:  MOV     #2,(R2)         ;INITIAL [DEST] = 2
017412  000257                         CCC                     ;CLEAR FLAGS
017414  000266                         266                     ;MAKE N:C = 0110
017416  005412                 I0245:  NEG     (2)             ;TEST THE NEG
017420  100003                         BPL     E10245
017422  001402                         BEQ     E10245          ;N:C = 1001?
017424  102401                         BVS     E10245
017426  103402                         BCS     A0245
017430  104000                 E10245: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017432  017406                         R0245                   ;ERROR LOOP RETURN
017434  021204                 A0245:  CMP     (R2),R4         ;CORRECT RESULT?
017436  001402                         BEQ     00245           ;BR IF YES
017440  104000                 E20245: ERROR                   ;NEG DELIVERED WRONG RESULT
017442  017406                         R0245                   ;ERROR LOOP RETURN
017444  000004                 00245:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
10436                                   ; ***************************************************************************
10437                                          .SBTTL T0246 NEG MODE 1 TEST : [DEST] < 0
10438                                   ; ***************************************************************************
10439
10440                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10441
10442                                   ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8
10443
10444                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016
10445
10446                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 000002
10447
10448                                   ;CODES:         [367] SPS=3  /  N:C = 0001
10449
10450                                   ;SYNC:          B05J2 (-) T = 2 USEC
10451
10452                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L
10453
10454  017446  012700  000246          T0246:  MOV     #0246,R0                ;LOAD R0 WITH TEST NO.
10455  017452  013701  017476                  MOV     @#I0246,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10456
10457  017456  012702  067602                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10458  017462  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
10459  017466  012712  177776          R0246:  MOV     #-2,(R2)        ;INITIAL [DEST] = 177776
10460  017472  000257                          CCC                     ;CLEAR FLAGS
10461  017474  000276                          276                     ;MAKE N:C = 1110
10462
10463  017476  005412          I0246:  NEG     (R2)            ;TEST THE NEG
10464
10465  017500  100403                  BMI     E10246
10466  017502  001402                  BEQ     E10246          ;N:C = 0001?
10467  017504  102401                  BVS     E10246
10468  017506  103402                  BCS     A0246
10469
10470  017510  104000          E10246: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
10471  017512  017466                  R0246                   ;ERROR LOOP RETURN
10472
10473  017514  021204          A0246:  CMP     (R2),R4         ;CORRECT RESULT = 2?
10474  017516  001402                  BEQ     00246           ;BR IF YES
10475
10476  017520  104000          E20246: ERROR                   ;NEG DELIVERED WRONG RESULT
10477  017522  017466                  R0246                   ;ERROR LOOP RETURN
10478
10479  017524  000004           00246: SCOPE                   ;CALL SCOPE LOOP UTILITY
10480
10481
```

```
10482                                   ; ***************************************************************
10483                                           .SBTTL T0247 NEG MODE 1 TEST: [DEST] = 100000 (8)
10484                                   ; ***************************************************************
10485
10486                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10487
10488                                   ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8
10489
10490                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016
10491
10492                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 100000
10493
10494                                   ;CODES:         [367] SPS=3  /  N:C = 1011
10495
10496                                   ;SYNC:          B05J2 (-) T = 2 USEC
10497
10498                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=1L  /  K3-4 NEG L
10499
10500  017526  012700  000247          T0247:  MOV     #0247,R0                ;LOAD R0 WITH TEST NO.
10501  017532  013701  017554                  MOV     @#I0247,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10502
10503  017536  012702  067602                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
10504  017542  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
10505  017546  010412                  R0247:  MOV     R4,(R2)         ;INITIAL [DEST] = 100000
10506  017550  000257                          CCC                     ;CLEAR FLAGS
10507  017552  000264                          SEZ                     ;MAKE N:Z = 0100
10508
10509  017554  005412                  I0247:  NEG     (R2)            ;TEST THE NEG
10510
10511  017556  100003                          BPL     E10247
10512  017560  001402                          BEQ     E10247          ;N:C = 1011?
10513  017562  102001                          BVC     E10247
10514  017564  103402                          BCS     A0247
10515
10516  017566  104000                  E10247: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
10517  017570  017546                          R0247                   ;ERROR LOOP RETURN
10518
10519  017572  021204                  A0247:  CMP     (R2),R4         ;CORRECT RESULT = 100000?
10520  017574  001402                          BEQ     00247           ;BR IF YES
10521
10522  017576  104000                  E20247: ERROR                   ;NEG DELIVERED WRONG RESULT
10523  017600  017546                          R0247                   ;ERROR LOOP RETURN
10524
10525  017602  000004                   00247: SCOPE                   ;CALL SCOPE LOOP UTILITY
10526
10527
```

```
10528                                   ; ***************************************************************************
10529                                          .SBTTL T0250 ROR TEST - DMO - <N:C> = 1110
10530                                   ; ***************************************************************************
10531
10532                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10533
10534                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10535
10536                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10537
10538                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 052525
10539
10540                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0000
10541
10542                                   ;SYNC:          B05J2 (-) T = 1.25 USEC
10543
10544                                   ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDMO (1) H  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR
10545                                                   ;  K3-8 ROT (R)L  /  K3-8 ROTSHF (R)H
10546
10547  017604  012700  000250          T0250:  MOV     #0250,R0                ;LOAD R0 WITH TEST NO.
10548  017610  013701  017634                  MOV     @#I0250,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10549  017614  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
10550  017620  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
10551  017624  012703  125252          R0250:  MOV     #125252,R3      ;[DEST] = 125252
10552  017630  000257                          CCC                     ;CLEAR FLAGS
10553  017632  000276                          276                     ;N:C = 1111
10554
10555  017634  006003          I0250:  ROR     R3              ;TEST THE ROR
10556
10557  017636  100403                  BMI     E10250          ;N:C = 0000 ?
10558  017640  001402                  BEQ     E10250
10559  017642  102401                  BVS     E10250
10560  017644  103002                  BCC     A0250
10561
10562  017646  104005          E10250: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10563  017650  017624                  R0250                   ;ERROR LOOP RETURN ADDRESS
10564
10565  017652  020403          A0250:  CMP     R4,R3           ;CORRECT RESULT ?
10566  017654  001402                  BEQ     00250           ;BR IF YES
10567
10568  017656  104000          E20250: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10569  017660  017624                  R0250                   ;ERROR LOOP RETURN
10570
10571  017662  000004          00250:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10572
```

```
10573                                   ; ***************************************************************************
10574                                          .SBTTL T0251 ROR TEST - DM0 - <N:C> = 1000
10575                                   ; ***************************************************************************
10576
10577                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10578
10579                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10580
10581                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10582
10583                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 000000
10584
10585                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0111
10586
10587                                   ;SYNC:          B05J2 (-) T = 1.25 USEC
10588
10589                                   ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 ROT (R)H
10590                                                   ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H
10591
10592  017664  012700  000251          T0251:  MOV     #0251,R0                ;LOAD R0 WITH TEST NO.
10593  017670  013701  017712                  MOV     @#I0251,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10594  017674  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
10595  017700  005004                          CLR     R4              ;RESULT S / B = 000000
10596  017702  012703  000001          R0251:  MOV     #1,R3           ;[DEST] = 1
10597  017706  000257                          CCC                     ;CLEAR FLAGS
10598  017710  000270                          SEN                     ;N:C = 1000
10599
10600  017712  006003                  I0251:  ROR     R3              ;TEST THE ROR
10601
10602  017714  100403                          BMI     E10251          ;N:C = 0111 ?
10603  017716  001002                          BNE     E10251
10604  017720  102001                          BVC     E10251
10605  017722  103402                          BCS     A0251
10606
10607  017724  104005                  E10251: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10608  017726  017702                          R0251                   ;ERROR LOOP RETURN ADDRESS
10609
10610  017730  020403                  A0251:  CMP     R4,R3           ;CORRECT RESULT ?
10611  017732  001402                          BEQ     00251           ;BR IF YES
10612
10613  017734  104000                  E20251: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10614  017736  017702                          R0251                   ;ERROR LOOP RETURN
10615
10616  017740  000004                  00251:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10617
```

```
10618                                   ; ***************************************************************************
10619                                         .SBTTL T0252 ROR TEST - DM0 - <N:C> = 0111
10620                                   ; ***************************************************************************
10621
10622                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10623
10624                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10625
10626                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10627
10628                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 125252
10629
10630                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 1001
10631
10632                                   ;SYNC:          B05J2 (-) T = 1.25 USEC
10633
10634                                   ;KEY SIG:       K1-5 D(C)(1) H  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-8 ROT (R)
10635                                   ;  /  K3-8 ROTSHF (R)H  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H
10636
10637  017742  012700  000252          T0252:  MOV     #0252,R0                ;LOAD R0 WITH TEST NO.
10638  017746  013701  017772                  MOV     @#I0252,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10639  017752  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
10640  017756  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
10641  017762  012703  052525          R0252:  MOV     #52525,R3       ;[DEST] = 052525
10642  017766  000257                          CCC                     ;CLEAR FLAGS
10643  017770  000267                          267                     ;N:C = 0111
10644
10645  017772  006003                  I0252:  ROR     R3              ;TEST THE ROR
10646
10647  017774  100003                          BPL     E10252          ;N:C = 1001 ?
10648  017776  001402                          BEQ     E10252
10649  020000  102401                          BVS     E10252
10650  020002  103402                          BCS     A0252
10651
10652  020004  104005                  E10252: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10653  020006  017762                          R0252                   ;ERROR LOOP RETURN ADDRESS
10654
10655  020010  020403                  A0252:  CMP     R4,R3           ;CORRECT RESULT ?
10656  020012  001402                          BEQ     00252           ;BR IF YES
10657
10658  020014  104000                  E20252: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10659  020016  017762                          R0252                   ;ERROR LOOP RETURN
10660
10661  020020  000004                  00252:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10662
```

```
10663                                   ; ***************************************************************************
10664                                   .SBTTL T0253 ASR TEST - DM0 - <N:C> = 1000
10665                                   ; ***************************************************************************
10666
10667                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10668
10669                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10670
10671                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10672
10673                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 000000
10674
10675                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0111
10676
10677                                   ;SYNC:          B05J2 (-) T = 1.25 USEC
10678
10679                                   ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 SHF (R)L
10680                                                   ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H
10681
10682  020022  012700  000253       T0253:  MOV     #0253,R0                ;LOAD R0 WITH TEST NO.
10683  020026  013701  020050               MOV     @#I0253,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10684  020032  012702  177703               MOV     #177703,R2      ;DEST ADDR = R3
10685  020036  005004                       CLR     R4              ;RESULT S / B = 000000
10686  020040  012703  000001       R0253:  MOV     #1,R3           ;[DEST] = 1
10687  020044  000257                       CCC                     ;CLEAR FLAGS
10688  020046  000270                       SEN                     ;N:C = 1000
10689
10690  020050  006003               I0253:  ROR     R3              ;TEST THE ROR
10691
10692  020052  100403                       BMI     E10253          ;N:C = 0111 ?
10693  020054  001002                       BNE     E10253
10694  020056  102001                       BVC     E10253
10695  020060  103402                       BCS     A0253
10696
10697  020062  104005               E10253: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10698  020064  020040                       R0253                   ;ERROR LOOP RETURN ADDRESS
10699
10700  020066  020403               A0253:  CMP     R4,R3           ;CORRECT RESULT ?
10701  020070  001402                       BEQ     00253           ;BR IF YES
10702
10703  020072  104000               E20253: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10704  020074  020040                       R0253                   ;ERROR LOOP RETURN
10705
10706  020076  000004               00253:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10707
```

```
10708                                   ; ***************************************************************************
10709                                          .SBTTL T0254 ASR TEST - DM0 - <N:C> = 0101
10710                                   ; ***************************************************************************
10711
10712                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10713
10714                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10715
10716                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10717
10718                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 152525
10719
10720                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 1010
10721
10722                                   ;SYNC:          B05J2 (-) T = 1.25 USEC
10723
10724                                   ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K1-5 D(C)(1)H
10725                                   ;  /  K3-4 OVLAP INSTR H  /  K3-8 SHF (R)L  /  K3-8 ROTSHF (R) H
10726
10727  020100  012700  000254          T0254:  MOV     #0254,R0                ;LOAD R0 WITH TEST NO.
10728  020104  013701  020130                  MOV     @#I0254,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10729  020110  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
10730  020114  012704  152525                  MOV     #152525,R4      ;RESULT S / B = 152525
10731  020120  012703  125252          R0254:  MOV     #125252,R3      ;[DEST] = 125252
10732  020124  000257                          CCC                     ;CLEAR FLAGS
10733  020126  000265                          265                     ;N:C = 0101
10734
10735  020130  006003                  I0254:  ROR     R3              ;TEST THE ROR
10736
10737  020132  100003                          BPL     E10254          ;N:C = 1010 ?
10738  020134  001402                          BEQ     E10254
10739  020136  102001                          BVC     E10254
10740  020140  103002                          BCC     A0254
10741
10742  020142  104005                  E10254: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10743  020144  020120                          R0254                   ;ERROR LOOP RETURN ADDRESS
10744
10745  020146  020403                  A0254:  CMP     R4,R3           ;CORRECT RESULT ?
10746  020150  001402                          BEQ     00254           ;BR IF YES
10747
10748  020152  104000                  E20254: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10749  020154  020120                          R0254                   ;ERROR LOOP RETURN
10750
10751  020156  000004                  00254:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10752
```

```
10753                                   ; ***************************************************************************
10754                                          .SBTTL T0255 ASR TEST - DM0 - <N:C> = 1100
10755                                   ; ***************************************************************************
10756
10757                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10758
10759                                   ;ROM SEQ:       [106,271,274,001] FC 1,9
10760
10761                                   ;ACT BUTS:      37[004]100,106 / 27[271]000,001
10762
10763                                   ;EXEC:          [106]ALUC=LLLLL :[271] D = 025252
10764
10765                                   ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0011
10766
10767                                   ;SYNC:          B05J2 (←) T = 1.25 USEC
10768
10769                                   ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 SHF (R)L
10770                                                   ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H
10771
10772  020160  012700  000255       T0255:  MOV     #0255,R0                ;LOAD R0 WITH TEST NO.
10773  020164  013701  020210               MOV     @#I0255,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10774  020170  012702  177703               MOV     #177703,R2      ;DEST ADDR = R3
10775  020174  012704  025252               MOV     #25252,R4       ;RESULT S / B = 25252
10776  020200  012703  052525       R0255:  MOV     #52525,R3       ;[DEST] = 52525
10777  020204  000257                       CCC                     ;CLEAR FLAGS
10778  020206  000274                       274                     ;N:C = 1100
10779
10780  020210  006003               I0255:  ROR     R3              ;TEST THE ROR
10781
10782  020212  100403                       BMI     E10255          ;N:C = 0011 ?
10783  020214  001402                       BEQ     E10255
10784  020216  102001                       BVC     E10255
10785  020220  103402                       BCS     A0255
10786
10787  020222  104005               E10255: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10788  020224  020200                       R0255                   ;ERROR LOOP RETURN ADDRESS
10789
10790  020226  020403               A0255:  CMP     R4,R3           ;CORRECT RESULT ?
10791  020230  001402                       BEQ     00255           ;BR IF YES
10792
10793  020232  104000               E20255: ERROR                   ;ROR DELIVERED THE WRONG RESULT
10794  020234  020200                       R0255                   ;ERROR LOOP RETURN
10795
10796  020236  000004               00255:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10797
```

```
10798                                   ; ***************************************************************************
10799                                           .SBTTL T0256 ROR TEST - DM1 - <N:C> = 1110
10800                                   ; ***************************************************************************
10801
10802                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10803
10804                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
10805
10806                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016
10807
10808                                   ;EXEC:          [232]ALUC=HHLHL :[275] D = 052525
10809
10810                                   ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 0000
10811
10812                                   ;SYNC:          B05J2 (-) T = 2 USEC
10813
10814                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
10815                                                   ;  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L
10816
10817  020240  012700  000256          T0256:  MOV     #0256,R0                ;LOAD R0 WITH TEST NO.
10818  020244  013701  020270                  MOV     @#I0256,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10819  020250  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
10820  020254  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
10821  020260  012712  125252          R0256:  MOV     #125252,(R2)    ;[DEST] = 125252
10822  020264  000257                          CCC                     ;CLEAR FLAGS
10823  020266  000276                          276                     ;N:C = 1110
10824
10825  020270  006012                  I0256:  ROR     (R2)            ;TEST THE ROR
10826
10827  020272  100403                          BMI     E10256          ;N:C = 0000 ?
10828  020274  001402                          BEQ     E10256
10829  020276  102401                          BVS     E10256
10830  020300  103002                          BCC     A0256
10831
10832  020302  104005                  E10256: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10833  020304  020260                          R0256                   ;ERROR LOOP RETURN
10834
10835  020306  020412                  A0256:  CMP     R4,(R2)         ;CORRECT RESULT ?
10836  020310  001403                          BEQ     00256           ;BR IF YES
10837
10838  020312  011203                          MOV     (R2),R3         ;GET THE WAS DATA
10839  020314  104000                  E20256: ERROR                   ;ROR DELIVERED WRONG RESULT
10840  020316  020260                          R0256                   ;ERROR LOOP RETURN ADDRESS
10841
10842  020320  000004                  00256:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10843
```

```
10844                                   ; ***************************************************************************
10845                                          .SBTTL T0257 ROR TEST - DM1 - <N:C> = 1000
10846                                   ; ***************************************************************************
10847
10848                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10849
10850                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
10851
10852                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016
10853
10854                                   ;EXEC:          [232]ALUC=HHLHL :[275] D = 000000
10855
10856                                   ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 0111
10857
10858                                   ;SYNC:          B05J2 (-) T = 2 USEC
10859
10860                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
10861                                                   ;  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L
10862
10863  020322  012700  000257          T0257:  MOV     #0257,R0                ;LOAD R0 WITH TEST NO.
10864  020326  013701  020350                  MOV     @#I0257,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10865  020332  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
10866  020336  005004                          CLR     R4              ;RESULT S / B = 000000
10867  020340  012712  000001          R0257:  MOV     #1,(R2)         ;[DEST] = 1
10868  020344  000257                          CCC                     ;CLEAR FLAGS
10869  020346  000270                          SEN                     ;N:C = 1000
10870
10871  020350  006012                  I0257:  ROR     (R2)            ;TEST THE ROR
10872
10873  020352  100403                          BMI     E10257          ;N:C = 0111 ?
10874  020354  001002                          BNE     E10257
10875  020356  102001                          BVC     E10257
10876  020360  103402                          BCS     A0257
10877
10878  020362  104005                  E10257: ERRORS                  ;ROR FAILED TO ALTER CODES PROPERLY
10879  020364  020340                          R0257                   ;ERROR LOOP RETURN
10880
10881  020366  020412                  A0257:  CMP     R4,(R2)         ;CORRECT RESULT ?
10882  020370  001403                          BEQ     00257           ;BR IF YES
10883
10884  020372  011203                          MOV     (R2),R3         ;GET THE WAS DATA
10885  020374  104000                  E20257: ERROR                   ;ROR DELIVERED WRONG RESULT
10886  020376  020340                          R0257                   ;ERROR LOOP RETURN ADDRESS
10887
10888  020400  000004                  00257:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10889
```

```
10890                                   ; ***************************************************************************
10891                                         .SBTTL T0260 ROR TEST - DM1 - <N:C> = 0111
10892                                   ; ***************************************************************************
10893
10894                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
10895
10896                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
10897
10898                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016
10899
10900                                   ;EXEC:          [232]ALUC=HHLHL :[275] D = 125252
10901
10902                                   ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 1001
10903
10904                                   ;SYNC:          B05J2 (-) T = 2 USEC
10905
10906                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
10907                                                   ;  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L  /  K1-5 D(C)(1) H
10908
10909  020402  012700  000260          T0260:  MOV     #0260,R0                ;LOAD R0 WITH TEST NO.
10910  020406  013701  020432                  MOV     @#I0260,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10911  020412  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
10912  020416  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
10913  020422  012712  052525          R0260:  MOV     #52525,(R2)     ;[DEST] = 52525
10914  020426  000257                          CCC                     ;CLEAR FLAGS
10915  020430  000267                          267                     ;N:C = 0111
10916
10917  020432  006012          I0260:  ROR     (R2)            ;TEST THE ROR
10918
10919  020434  100003                  BPL     E10260          ;N:C = 1001 ?
10920  020436  001402                  BEQ     E10260
10921  020440  102401                  BVS     E10260
10922  020442  103402                  BCS     A0260
10923
10924  020444  104005          E10260: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10925  020446  020422                  R0260                   ;ERROR LOOP RETURN
10926
10927  020450  020412          A0260:  CMP     R4,(R2)         ;CORRECT RESULT ?
10928  020452  001403                  BEQ     00260           ;BR IF YES
10929
10930  020454  011203                  MOV     (R2),R3         ;GET THE WAS DATA
10931  020456  104000          E20260: ERROR                   ;ROR DELIVERED WRONG RESULT
10932  020460  020422                  R0260                   ;ERROR LOOP RETURN ADDRESS
10933
10934  020462  000004          00260:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10935
```

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10936                                   ; ***************************************************************************
10937                                         .SBTTL T0261 ASR TEST - DM1 - <N:C> = 1000
10938                                   ; ***************************************************************************
10939
10940                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
10941
10942                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
10943
10944                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,016
10945
10946                                   ;EXEC:          [232]ALUC=HHLHL :[275] D = 000000
10947
10948                                   ;CODES:         [232] SPS=1, [277] SPS=2   /   N:C = 0111
10949
10950                                   ;SYNC:          B05J2 (-) T = 2 USEC
10951
10952                                   ;KEY SIG:       K3-3 DM=1L   /   K3-6 ROTSHF L   /   K3-8 SHF (R) L   /   K3-8 ROTSHF (R
10953                                   ;   K2-5 SDM1 (1) H   /   K2-5 SDM0 (1) L
10954
10955  020464  012700  000261   T0261:  MOV     #0261,R0                ;LOAD R0 WITH TEST NO.
10956  020470  013701  020512            MOV     @#I0261,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
10957  020474  012702  067602            MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
10958  020500  005004                    CLR     R4              ;RESULT S  /  B = 000000
10959  020502  012712  000001   R0261:  MOV     #1,(R2)         ;[DEST] = 1
10960  020506  000257                    CCC                     ;CLEAR FLAGS
10961  020510  000270                    SEN                     ;N:C = 1000
10962
10963  020512  006012           I0261:  ROR     (R2)            ;TEST THE ROR
10964
10965  020514  100403                    BMI     E10261          ;N:C = 0111 ?
10966  020516  001002                    BNE     E10261
10967  020520  102001                    BVC     E10261
10968  020522  103402                    BCS     A0261
10969
10970  020524  104005           E10261: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
10971  020526  020502                    R0261                   ;ERROR LOOP RETURN
10972
10973  020530  020412           A0261:  CMP     R4,(R2)         ;CORRECT RESULT ?
10974  020532  001403                    BEQ     00261           ;BR IF YES
10975
10976  020534  011203                    MOV     (R2),R3         ;GET THE WAS DATA
10977  020536  104000           E20261: ERROR                   ;ROR DELIVERED WRONG RESULT
10978  020540  020502                    R0261                   ;ERROR LOOP RETURN ADDRESS
10979
10980  020542  000004           00261:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
10981
```

```
10982                                   ; ***************************************************************************
10983                                         .SBTTL T0262 ASR TEST - DM1 - <N:C> = 1100
10984                                   ; ***************************************************************************
10985
10986                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
10987
10988                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
10989
10990                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,016
10991
10992                                   ;EXEC:          [232]ALUC=HHLHL :[275] D= 025252
10993
10994                                   ;CODES:         [232] SPS=1, [277] SPS=2   /   N:C = 0011
10995
10996                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
10997
10998                                   ;KEY SIG:       K3-3 DM=1L   /   K3-6 ROTSHF L   /   K3-8 SHF (R) L   /   K3-8 ROTSHF (R
10999                                   ;   K2-5 SDM1(1) H   /   K2-5 SDM0 (1) L
11000
11001  020544  012700  000262   T0262:  MOV     #0262,R0            ;LOAD R0 WITH TEST NO.
11002  020550  013701  020574           MOV     @#I0262,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11003  020554  012702  067602           MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11004  020560  012704  025252           MOV     #25252,R4       ;RESULT S  /  B = 25252
11005  020564  012712  052525   R0262:  MOV     #52525,(R2)     ;[DEST] = 52525
11006  020570  000257                   CCC                     ;CLEAR FLAGS
11007  020572  000274                   274                     ;N:C = 1100
11008
11009  020574  006012           I0262:  ROR     (R2)            ;TEST THE ROR
11010
11011  020576  100403                   BMI     E10262          ;N:C = 0011 ?
11012  020600  001402                   BEQ     E10262
11013  020602  102001                   BVC     E10262
11014  020604  103402                   BCS     A0262
11015
11016  020606  104005   E10262: ERROR5                          ;ROR FAILED TO ALTER CODES PROPERLY
11017  020610  020564                   R0262                   ;ERROR LOOP RETURN
11018
11019  020612  020412   A0262:  CMP     R4,(R2)         ;CORRECT RESULT ?
11020  020614  001403                   BEQ     00262           ;BR IF YES
11021
11022  020616  011203                   MOV     (R2),R3         ;GET THE WAS DATA
11023  020620  104000   E20262: ERROR                           ;ROR DELIVERED WRONG RESULT
11024  020622  020564                   R0262                   ;ERROR LOOP RETURN ADDRESS
11025
11026  020624  000004   00262:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
11027
```

```
11028                                   ; ***************************************************************************
11029                                         .SBTTL T0263 ASR TEST - DM1 - <N:C> = 0101
11030                                   ; ***************************************************************************
11031
11032                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11033
11034                                   ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9
11035
11036                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016
11037
11038                                   ;EXEC:          [232]ALUC=HHLHL :[275] D= 152525
11039
11040                                   ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 1010
11041
11042                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
11043
11044                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 SHF (R) L  /  K3-8 ROTSHF (R) L
11045                                                   ;  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L  /  K1-5 D(C)(1) H
11046
11047  020626  012700  000263           T0263:  MOV     #0263,R0                ;LOAD R0 WITH TEST NO.
11048  020632  013701  020656                   MOV     @#I0263,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11049  020636  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11050  020642  012704  152525                   MOV     #152525,R4      ;RESULT S / B = 152525
11051  020646  012712  125252           R0263:  MOV     #125252,(R2)    ;[DEST] = 125252
11052  020652  000257                           CCC                     ;CLEAR FLAGS
11053  020654  000265                           265                     ;N:C = 0101
11054
11055  020656  006012                   I0263:  ROR     (R2)            ;TEST THE ROR
11056
11057  020660  100003                           BPL     E10263          ;N:C = 1010 ?
11058  020662  001402                           BEQ     E10263
11059  020664  102001                           BVC     E10263
11060  020666  103002                           BCC     A0263
11061
11062  020670  104005                   E10263: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
11063  020672  020646                           R0263                   ;ERROR LOOP RETURN
11064
11065  020674  020412                   A0263:  CMP     R4,(R2)         ;CORRECT RESULT ?
11066  020676  001403                           BEQ     00263           ;BR IF YES
11067
11068  020700  011203                           MOV     (R2),R3         ;GET THE WAS DATA
11069  020702  104000                   E20263: ERROR                   ;ROR DELIVERED WRONG RESULT
11070  020704  020646                           R0263                   ;ERROR LOOP RETURN ADDRESS
11071
11072  020706  000004                   00263:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
11073
```

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11074                                   ; ***************************************************************************
11075                                           .SBTTL T0264 RORB TEST - DM2 - EVEN ADDRESS
11076                                   ; ***************************************************************************
11077
11078                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11079
11080                                   ;ROM SEQ:       [162,260,267,233,276,277,376,016] FC 1,3,9
11081
11082                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,233 / 16[277]016,016
11083
11084                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 077777
11085
11086                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 0000
11087
11088                                   ;SYNC:          B05J2 (-) T = 2.4 USEC
11089
11090                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-5 D(C)(1) H
11091
11092  020710  012700  000264          T0264:  MOV     #0264,R0                ;LOAD R0 WITH TEST NO.
11093  020714  013701  020740                  MOV     @#I0264,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11094  020720  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11095  020724  012704  000177                  MOV     #177,R4         ;RESULT S / B = 177
11096  020730  010203                  R0264:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11097  020732  012712  000377                  MOV     #377,(R2)       ;[DEST] = 377
11098  020736  000257                          CCC                     ;SCOPE SYNC "C" = 0
11099
11100  020740  106023                  I0264:  RORB    (R3)+           ;TEST THE RORB
11101
11102  020742  103402                          BCS     A0264           ;BR IF ROR SET "C"
11103
11104  020744  104005                  E10264: ERROR5                  ;ROR FAILED TO SET "C"
11105  020746  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS
11106
11107  020750  022703  067603          A0264:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
11108  020754  001402                          BEQ     B0264           ;BR IF YES
11109
11110  020756  104005                  E20264: ERROR5                  ;RORB FAILED TO UPDATE DEST REG
11111  020760  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS
11112
11113  020762  020412                  B0264:  CMP     R4,(R2)         ;CORRECT RESULT ?
11114  020764  001403                          BEQ     00264           ;BR IF YES
11115
11116  020766  011203                          MOV     (R2),R3         ;GET THE WAS DATA
11117  020770  104000                  E30264: ERROR                   ;RORB DELIVERED WRONG RESULT
11118  020772  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS
11119
11120  020774  000004                  00264:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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11121                                   ; ***************************************************************************
11122                                          .SBTTL T0265 RORB TEST - DM1 - EVEN ADDRESS
11123                                   ; ***************************************************************************
11124
11125                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11126
11127                                   ;ROM SEQ:       [161,266,267,233,276,277,376,016] FC 1,3,9
11128
11129                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,233 / 16[277]016,016
11130
11131                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 077777
11132
11133                                   ;CODES:         [233] SPS=1, [277] SPS=  /  N:C = 1010
11134
11135                                   ;SYNC:          BOSJ2 (-) T = 2.4 USEC
11136
11137                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-5 D(C)(1) H
11138
11139  020776  012700  000265           T0265:  MOV     #0265,R0                ;LOAD R0 WITH TEST NO.
11140  021002  013701  021030                   MOV     @#I0265,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11141  021006  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11142  021012  012704  000377                   MOV     #377,R4         ;RESULT S / B = 377
11143  021016  010203           R0265:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11144  021020  012712  000376                   MOV     #376,(R2)       ;[DEST] = 376
11145  021024  000257                           CCC                     ;CLEAR FLAGS
11146  021026  000261                           SEC                     ;SCOPE SYNC - SET "C"
11147
11148  021030  106013           I0265:  RORB    (R3)                    ;TEST THE RORB
11149
11150  021032  103002                   BCC     A0265           ;BR IF "C" CLR - IT SHOULD BE
11151
11152  021034  104005           E10265: ERROR5                  ;RORB FAILED TO CLR "C"
11153  021036  021016                   R0265                   ;ERROR LOOP RETURN ADDRESS
11154
11155  021040  020412           A0265:  CMP     R4,(R2)         ;CORRECT RESULT ?
11156  021042  001403                   BEQ     00265           ;BR IF YES
11157
11158  021044  011203                   MOV     (R2),R3         ;GET THE WAS DATA
11159  021046  104000           E20265: ERROR                   ;RORB DELIVERED WRONG RESULT
11160  021050  021016                   R0265                   ;ERROR LOOP RETURN ADDRESS
11161
11162  021052  000004           00265:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11163                                   ; ***************************************************************************
11164                                         .SBTTL T0266 RORB TEST - DM2 - ODD ADDRESS
11165                                   ; ***************************************************************************
11166
11167                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11168
11169                                   ;ROM SEQ:       [162,260,267,237,270,233,276,277,376,016] FC 1,3,9
11170
11171                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,233 / 16[277]016,016
11172
11173                                   ;EXEC:          [233] DMUX SHIFT RIGHT : [277] D = 77577
11174
11175                                   ;CODES:         [233] SPS=1, [277] SPS=3  /  N:C = 0011
11176
11177                                   ;SYNC:          BOSJ2 (-) T = 2.8 USEC
11178
11179                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H
11180
11181  021054  012700  000266           T0266:  MOV     #0266,R0                ;LOAD R0 WITH TEST NO.
11182  021060  013701  021110                   MOV     @#I0266,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11183  021064  012702  067603                   MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
11184  021070  012704  077777                   MOV     #77777,R4       ;RESULT S / B = 77777
11185  021074  012705  067602                   MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
11186  021100  010203           R0266:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11187  021102  012715  177777                   MOV     #-1,(R5)        ;[DEST] = 177777
11188  021106  000257                           CCC                     ;SCOPE SYNC - "C" =0
11189
11190  021110  106023           I0266:  RORB    (R3)+           ;TEST THE RORB
11191
11192  021112  103402                   BCS     A0266           ;BR IF "C" IS SET - IT SHOULD BE
11193
11194  021114  104005           E10266: ERROR5                  ;RORB FAILED TO SET "C"
11195  021116  021100                   R0266                   ;ERROR LOOP RETURN ADDRESS
11196
11197  021120  022703  067604   A0266:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
11198  021124  001402                   BEQ     B0266           ;BR IF YES
11199
11200  021126  104005           E20266: ERROR5                  ;RORB FAILED TO UPDATE DEST REG
11201  021130  021100                   R0266                   ;ERROR LOOP RETURN ADDRESS
11202
11203  021132  020415           B0266:  CMP     R4,(R5)         ;CORRECT RESULT ?
11204  021134  001403                   BEQ     00266           ;BR IF YES
11205
11206  021136  011503                   MOV     (R5),R3         ;GET THE WAS DATA
11207  021140  104000           E30266: ERROR                   ;RORB DELIVERED WRONG RESULT
11208  021142  021100                   R0266                   ;ERROR LOOP RETURN ADDRESS
11209
11210  021144  000004           00266:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11211                                   ; ***************************************************************************
11212                                          .SBTTL T0267 RORB TEST - DM1 - ODD ADDRESS
11213                                   ; ***************************************************************************
11214
11215                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11216
11217                                   ;ROM SEQ:       [161,266,267,237,270,233,276,277,376,016] FC 1,3,9
11218
11219                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,233 / 16[277]016,016
11220
11221                                   ;EXEC:           [233] DMUX SHIFT RIGHT :[277] D = 177777
11222
11223                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C - 1010
11224
11225                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
11226
11227                                   ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1
11228
11229  021146  012700  000267          T0267:  MOV     #0267,R0                ;LOAD R0 WITH TEST NO.
11230  021152  013701  021202                  MOV     @#I0267,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11231  021156  012702  067603                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
11232  021162  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
11233  021166  012705  067602                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
11234  021172  010203                  R0267:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11235  021174  012715  177377                  MOV     #177377,(R5)    ;[DEST] = 177377
11236  021200  000261                          SEC                     ;SCOPE SYNC - SET "C"
11237
11238  021202  106023          I0267:  RORB    (R3)+           ;TEST THE RORB
11239
11240  021204  103002                  BCC     A0267           ;BR IF "C" CLEAR - IT SHOULD BE
11241
11242  021206  104005          E10267: ERROR5                  ;RORB FAILED TO CLEAR "C"
11243  021210  021172                  R0267                   ;ERROR LOOP RETURN ADDRESS
11244
11245  021212  020415          A0267:  CMP     R4,(R5)         ;CORRECT RESULT ?
11246  021214  001403                  BEQ     00267           ;BR IF YES
11247
11248  021216  011503                  MOV     (R5),R3         ;GET THE WAS DATA
11249  021220  104000          E20267: ERROR                   ;RORB DELIVERED WRONG RESULT
11250  021222  021172                  R0267                   ;ERROR LOOP RETURN ADDRESS
11251
11252  021224  000004          00267:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11253                                   ; ***************************************************************************
11254                                   .SBTTL T0270 ASRB TEST - DM2 - ODD ADDRESS
11255                                   ; ***************************************************************************
11256
11257                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11258
11259                                   ;ROM SEQ:       [162,260,267,237,270,233,276,277,376,016] FC 1,3,9
11260
11261                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,233 / 16[277]016,016
11262
11263                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 000000
11264
11265                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 0111
11266
11267                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
11268
11269                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H
11270
11271  021226  012700  000270           T0270:  MOV     #0270,R0                ;LOAD R0 WITH TEST NO.
11272  021232  013701  021262                   MOV     @#I0270,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11273  021236  012702  067603                   MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
11274  021242  012704  000377                   MOV     #377,R4         ;RESULT S / B = 377
11275  021246  012705  067602                   MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
11276  021252  010203                   R0270:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11277  021254  012715  000777                   MOV     #777,(R5)       ;[DEST] = 777
11278  021260  000257                           CCC                     ;SCOPE SYNC "C" = 0
11279
11280  021262  106223                   I0270:  ASRB    (R3)+           ;TEST THE ASRB
11281
11282  021264  103402                           BCS     A0270           ;BR IF CARRY SET - IT SHOULD BE
11283
11284  021266  104005                   E10270: ERROR5                  ;ASRB FAILED TO SET THE CARRY
11285  021270  021252                           R0270                   ;ERROR LOOP RETURN ADDRESS
11286
11287  021272  022703  067604           A0270:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
11288  021276  001402                           BEQ     B0270           ;BR IF YES
11289
11290  021300  104005                   E20270: ERROR5                  ;ASRB FAILED TO UPDATE DEST REG
11291  021302  021252                           R0270                   ;ERROR LOOP RETURN ADDRESS
11292
11293  021304  020415                   B0270:  CMP     R4,(R5)         ;CORRECT RESULT ?
11294  021306  001403                           BEQ     00270           ;BR IF YES
11295
11296  021310  011503                           MOV     (R5),R3         ;GET THE WAS DATA
11297  021312  104000                   E30270: ERROR                   ;ASRB DELIVERED WRONG RESULT
11298  021314  021252                           R0270                   ;ERROR LOOP RETURN ADDRESS
11299
11300  021316  000004                   00270:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11301                                   ; ***************************************************************************
11302                                           .SBTTL T0271 ASRB TEST - DM1 - ODD ADDRESS
11303                                   ; ***************************************************************************
11304
11305                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11306
11307                                   ;ROM SEQ:       [161,266,267,237,270,233,276,277,376,016] FC 1,3,9
11308
11309                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,233 / 16[277]016,016
11310
11311                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 140300
11312
11313                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 1010
11314
11315                                   ;SYNC:          BOSJ2 (-) T = 2.8 USEC
11316
11317                                   ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BAOO(1
11318
11319  021320  012700  000271          T0271:  MOV     #0271,R0                ;LOAD R0 WITH TEST NO.
11320  021324  013701  021354                  MOV     @#I0271,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11321  021330  012702  067603                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
11322  021334  012704  140377                  MOV     #140377,R4      ;RESULT S / B = 140377
11323  021340  012705  067602                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
11324  021344  010203                  R0271:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11325  021346  012715  100377                  MOV     #100377,(R5)    ;[DEST] = 100377
11326  021352  000261                          SEC                     ;SCOPE SYNC - "C" = 1
11327
11328  021354  106213                  I0271:  ASRB    (R3)            ;TEST THE ASRB
11329
11330  021356  103002                          BCC     A0271           ;BR IF CARRY CLEAR - IT SHOULD BE
11331
11332  021360  104005                  E10271: ERROR5                  ;ASRB FAILED TO CLEAR THE CARRY
11333  021362  021344                          R0271                   ;ERROR LOOP RETURN ADDRESS
11334
11335  021364  020415                  A0271:  CMP     R4,(R5)         ;CORRECT RESULT ?
11336  021366  001403                          BEQ     00271           ;BR IF YES
11337
11338  021370  011503                          MOV     (R5),R3         ;GET THE WAS DATA
11339  021372  104000                  E20271: ERROR                   ;ASRB DELIVERED WRONG RESULT
11340  021374  021344                          R0271                   ;ERROR LOOP RETURN ADDRESS
11341
11342  021376  000004                  00271:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11343                                   ; ***************************************************************************
11344                                   .SBTTL T0272 ASRB TEST - DM2 - EVEN ADDRESS
11345                                   ; ***************************************************************************
11346
11347                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11348
11349                                   ;ROM SEQ:       [162,260,267,233,276,277,376,016] FC 1,3,9
11350
11351                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,233 / 16[277]016,016
11352
11353                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D =
11354
11355                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C =
11356
11357                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
11358
11359                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 DM=2L
11360
11361  021400  012700  000272          T0272:  MOV     #0272,R0                ;LOAD R0 WITH TEST NO.
11362  021404  013701  021430                  MOV     @#I0272,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11363  021410  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11364  021414  012704  000077                  MOV     #77,R4          ;RESULT S / B = 77
11365  021420  010203          R0272:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11366  021422  012712  000177                  MOV     #177,(R2)       ;[DEST] = 177
11367  021426  000257                          CCC                     ;SCOPE SYNC - "C" = 0
11368
11369  021430  106223          I0272:  ASRB    (R3)+           ;TEST THE ASRB
11370
11371  021432  103402                  BCS     A0272           ;BR IF "C" = 1 - IT SHOULD BE
11372
11373  021434  104005          E10272: ERROR5                  ;ASRB FAILED TO SET "C"
11374  021436  021420                  R0272                   ;ERROR LOOP RETURN ADDRESS
11375
11376  021440  022703  067603  A0272:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
11377  021444  001402                  BEQ     B0272           ;BR IF YES
11378
11379  021446  104005          E20272: ERROR5                  ;ASRB FAILED TO UPDATE DEST REG
11380  021450  021420                  R0272                   ;ERROR LOOP RETURN ADDRESS
11381
11382  021452  020412          B0272:  CMP     R4,(R2)         ;CORRECT RESULT ?
11383  021454  001403                  BEQ     00272           ;BR IF YES
11384
11385  021456  011203                  MOV     (R2),R3         ;GET THE WAS DATA
11386  021460  104000          E30272: ERROR                   ;ASRB DELIVERED WRONG RESULT
11387  021462  021420                  R0272                   ;ERROR LOOP RETURN ADDRESS
11388
11389  021464  000004          00272:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11390                                   ; ***************************************************************************
11391                                           .SBTTL T0273 ASRB TEST - DM1 - EVEN ADDRESS
11392                                   ; ***************************************************************************
11393
11394                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11395
11396                                   ;ROM SEQ:       [161,266,267,233,276,277,376,016] FC 1,3,9
11397
11398                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,233 / 16[277]016,016
11399
11400                                   ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 141703
11401
11402                                   ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 1010
11403
11404                                   ;SYNC:          B05J2 (-) T = 2.4 USEC
11405
11406                                   ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H
11407
11408  021466  012700  000273          T0273:  MOV     #0273,R0                ;LOAD R0 WITH TEST NO.
11409  021472  013701  021516                  MOV     @#I0273,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11410  021476  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
11411  021502  012704  000303                  MOV     #303,R4         ;RESULT S / B = 303
11412  021506  010203                  R0273:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
11413  021510  012712  000206                  MOV     #206,(R2)       ;[DEST] = 206
11414  021514  000261                          SEC                     ;SCOPE SYNC - "C" = 1
11415
11416  021516  106213                  I0273:  ASRB    (R3)            ;TEST THE CLRASRB
11417
11418  021520  103002                          BCC     A0273           ;BR IF CARRY CLEAR - ITSHOULD BE
11419
11420  021522  104005                  E10273: ERROR5                  ;ASRB FAILED TO CLEAR THE CARRY
11421  021524  021506                          R0273                   ;ERROR LOOP RETURN ADDRESS
11422
11423  021526  020412                  A0273:  CMP     R4,(R2)         ;CORRECT RESULT ?
11424  021530  001403                          BEQ     00273           ;BR IF YES
11425
11426  021532  011203                          MOV     (R2),R3         ;GET THE WAS DATA
11427  021534  104000                  E20273: ERROR                   ;ASRB DELIVERED WRONG RESULT
11428  021536  021506                          R0273                   ;ERROR LOOP RETURN ADDRESS
11429
11430  021540  000004                  00273:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11431                                   ; ***************************************************************************
11432                                          .SBTTL T0274 TST DM0 TEST - <N:C> = 1011
11433                                   ; ***************************************************************************
11434
11435                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11436
11437                                   ;ROM SEQ:       [104,373,362,001] FC 1,7,8
11438
11439                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001
11440
11441                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000
11442
11443                                   ;CODES:         [373] SPS=1, [362] SPS=2  /  N:C = 0100
11444
11445                                   ;SYNC:          B05J2 (-) T = 1 USEC
11446
11447                                   ;KEY SIG:       K3-3 DM=0L  /  K1-7 D(15:00)=0 H  /  K3-4 TST L  /  K3-4 OVLAP INSTR H
11448
11449  021542  012700  000274           T0274:  MOV     #0274,R0                ;LOAD R0 WITH TEST NO.
11450  021546  013701  021600                   MOV     @#I0274,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11451  021552  032737  000040  066642           BIT     #40,@#BPTLOC    ;BREAKPOINT HALT SET ??
11452  021560  001401                           BEQ     .+4             ;BR IF NOT
11453  021562  000000                           HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
11454  021564  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
11455  021570  005004                           CLR     R4              ;RESULT S / B = 000000
11456  021572  005003                   R0274:  CLR     R3              ;[DEST] = 000000
11457  021574  000257                           CCC                     ;CLEAR CODES
11458  021576  000273                           273                     ;N:C=1011
11459
11460  021600  005703                   I0274:  TST     R3              ;TEST THE TST
11461
11462  021602  100403                           BMI     E10274          ;N:C = 0100 ?
11463  021604  001002                           BNE     E10274
11464  021606  102401                           BVS     E10274
11465  021610  103002                           BCC     A0274
11466
11467  021612  104005                   E10274: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
11468  021614  021572                           R0274                   ;ERROR LOOP RETURN
11469
11470  021616  020403                   A0274:  CMP     R4,R3           ;RESULT OK ?
11471  021620  001402                           BEQ     00274           ;BR IF YES
11472
11473  021622  104000                   E20274: ERROR                   ;TST ALTERED THE [DEST]
11474  021624  021572                           R0274                   ;ERROR LOOP RETURN
11475
11476  021626  000004                   00274:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
11477                                   ; ***************************************************************************
11478                                          .SBTTL T0275 TST DMO TEST - <N:C> = 0100
11479                                   ; ***************************************************************************
11480
11481                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11482
11483                                   ;ROM SEQ:       [104,373,362,001] FC 1,7,8
11484
11485                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001
11486
11487                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 177777
11488
11489                                   ;CODES:         [373] SPS=1, [362] SPS=3  /  N:C = 1000
11490
11491                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
11492
11493                                   ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 TST L
11494
11495  021630  012700  000275          T0275:  MOV     #0275,R0                ;LOAD R0 WITH TEST NO.
11496  021634  013701  021656                  MOV     @#I0275,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11497  021640  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11498  021644  005004                          CLR     R4
11499  021646  005104                          COM     R4              ;RESULT S / B = 177777
11500  021650  010403                  R0275:  MOV     R4,R3           ;[DEST] = 177777
11501  021652  000257                          CCC                     ;CLEAR CODES
11502  021654  000264                          264                     ;N:C=0100
11503
11504  021656  005703                  I0275:  TST     R3              ;TEST THE TST
11505
11506  021660  100003                          BPL     E10275          ;N:C = 1000 ?
11507  021662  001402                          BEQ     E10275
11508  021664  102401                          BVS     E10275
11509  021666  103002                          BCC     A0275
11510
11511  021670  104005                  E10275: ERROR5                  ;TST [illegible] ALTER CODES PROPERLY
11512  021672  021650                          R0275                   ;[illegible] JRN
11513
11514  021674  020403                  A0275:  CMP     R4,R3           ;[illegible] ?
11515  021676  001402                          BEQ     00275           ;BR [illegible]
11516
11517  021700  104000                  E20275: ERROR                   ;TST [illegible] THE [DEST]
11518  021702  021650                          R0275                   ;ERROR [illegible]OP RETURN
11519
11520  021704  000004                  00275:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11521
```

```
11522                                   ; ***************************************************************************
11523                                           .SBTTL T0276 CLR DMD TEST - <N:C> = 1011
11524                                   ; ***************************************************************************
11525
11526                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11527
11528                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11529
11530                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11531
11532                                   ;EXEC:          [104]ALUC=HLLHH :[373] D = 000000
11533
11534                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100
11535
11536                                   ;SYNC:          B05J2 (-) T = 1 USEC
11537
11538                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 CLR L
11539
11540  021706  012700  000276          T0276:  MOV     #0276,R0                ;LOAD R0 WITH TEST NO.
11541  021712  013701  021734                  MOV     @#I0276,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11542  021716  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11543  021722  005004                          CLR     R4              ;RESULT S / B = 000000
11544  021724  012703  177777          R0276:  MOV     #-1,R3          ;[DEST] = 177777
11545  021730  000257                          CCC                     ;CLEAR CODES
11546  021732  000273                          273                     ;N:C = 1011
11547
11548  021734  005003                  I0276:  CLR     R3              ;TEST THE CLR
11549
11550  021736  100403                          BMI     E10276          ;N:C = 0100 ?
11551  021740  001002                          BNE     E10276
11552  021742  102401                          BVS     E10276
11553  021744  103002                          BCC     A0276
11554
11555  021746  104005                  E10276: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
11556  021750  021724                          R0276                   ;ERROR LOOP RETURN
11557  021752  020403                  A0276:  CMP     R4,R3           ;RESULT OK ?
11558  021754  001402                          BEQ     00276           ;BR IF YES
11559
11560  021756  104000                  E20276: ERROR                   ;CLR DELIVERED THE WRONG RESULT
11561  021760  021724                          R0276                   ;ERROR LOOP RETURN
11562
11563  021762  000004                  00276:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11564
```

```
11565                                   ; ***************************************************************************
11566                                           .SBTTL T0277 CLR DMO TEST - <N:C> = 0000
11567                                   ; ***************************************************************************
11568
11569                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11570
11571                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11572
11573                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11574
11575                                   ;EXEC:          [104]ALUC=HLLHH :[373] D = 000000
11576
11577                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100
11578
11579                                   ;SYNC:          B05J2 (-) T = 1 USEC
11580
11581                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 CLR L
11582
11583  021764  012700  000277          T0277:  MOV     #0277,R0                ;LOAD R0 WITH TEST NO.
11584  021770  013701  022010                  MOV     @#I0277,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11585  021774  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11586  022000  005004                          CLR     R4              ;RESULT S / B = 000000
11587  022002  012703  177777          R0277:  MOV     #-1,R3          ;[DEST] = 177777
11588  022006  000257                          CCC                     ;CLEAR CODES
11589
11590  022010  005003                  I0277:  CLR     R3              ;TEST THE CLR
11591
11592  022012  100403                          BMI     E10277          ;N:C = 0100 ?
11593  022014  001002                          BNE     E10277
11594  022016  102401                          BVS     E10277
11595  022020  103002                          BCC     A0277
11596
11597  022022  104005                  E10277: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
11598  022024  022002                          R0277                   ;ERROR LOOP RETURN
11599  022026  020403                  A0277:  CMP     R4,R3           ;RESULT OK ?
11600  022030  001402                          BEQ     00277           ;BR IF YES
11601
11602  022032  104000                  E20277: ERROR                   ;CLR DELIVERED THE WRONG RESULT
11603  022034  022002                          R0277                   ;ERROR LOOP RETURN
11604
11605  022036  000004                  00277:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11606
```

```
11607                                   ; ***************************************************************************
11608                                   .SBTTL T0300 COM DMD TEST - <N:C> = 0110
11609                                   ; ***************************************************************************
11610
11611                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11612
11613                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11614
11615                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11616
11617                                   ;EXEC:          [104]ALUC=HLLLL :[373] D = 125252
11618
11619                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1001
11620
11621                                   ;SYNC:          B05J2 (-) T = 1 USEC
11622
11623                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 COM L
11624
11625  022040  012700  000300  T0300:  MOV     #0300,R0                ;LOAD R0 WITH TEST NO.
11626  022044  013701  022070          MOV     @#I0300,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11627  022050  012702  177703          MOV     #177703,R2      ;DEST ADDR = R3
11628  022054  012704  125252          MOV     #125252,R4      ;RESULT S / B = 125252
11629  022060  012703  052525  R0300:  MOV     #52525,R3       ;[DEST] = 52525
11630  022064  000257                  CCC                     ;CLEAR CODES
11631  022066  000266                  266                     ;N:C = 0110
11632
11633  022070  005103          I0300:  COM     R3              ;TEST THE COM
11634
11635  022072  100003                  BPL     E10300          ;N:C = 1001 ?
11636  022074  001402                  BEQ     E10300
11637  022076  102401                  BVS     E10300
11638  022100  103402                  BCS     A0300
11639
11640  022102  104005          E10300: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
11641  022104  022060                  R0300                   ;ERROR LOOP RETURN
11642  022106  020403          A0300:  CMP     R4,R3           ;RESULT OK ?
11643  022110  001402                  BEQ     00300           ;BR IF YES
11644
11645  022112  104000          E20300: ERROR                   ;COM DELIVERED THE WRONG RESULT
11646  022114  022060                  R0300                   ;ERROR LOOP RETURN
11647
11648  022116  000004          00300:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11649
11650
```

```
11651                                   ; ***************************************************************************
11652                                           .SBTTL T0301 COM DMD TEST - <N:C> = 1001
11653                                   ; ***************************************************************************
11654
11655                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11656
11657                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11658
11659                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11660
11661                                   ;EXEC:          [104]ALUC=HLLLL :[373] D = 000000
11662
11663                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C =0101
11664
11665                                   ;SYNC:          B05J2 (-) T = 1 USEC
11666
11667                                   ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 COM L
11668
11669  022120  012700  000301          T0301:  MOV     #0301,R0                ;LOAD R0 WITH TEST NO.
11670  022124  013701  022146                  MOV     @#I0301,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11671  022130  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11672  022134  005004                          CLR     R4              ;RESULT S / B = 000000
11673  022136  012703  177777          R0301:  MOV     #-1,R3          ;[DEST] = 177777
11674  022142  000257                          CCC                     ;CLEAR CODES
11675  022144  000271                          271                     ;N:C = 1001
11676
11677  022146  005103                  I0301:  COM     R3              ;TEST THE COM
11678
11679  022150  100403                          BMI     E10301          ;N:C = 0101 ?
11680  022152  001002                          BNE     E10301
11681  022154  102401                          BVS     E10301
11682  022156  103402                          BCS     A0301
11683
11684  022160  104005                  E10301: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
11685  022162  022136                          R0301                   ;ERROR LOOP RETURN
11686  022164  020403                  A0301:  CMP     R4,R3           ;RESULT OK ?
11687  022166  001402                          BEQ     00301           ;BR IF YES
11688
11689  022170  104000                  E20301: ERROR                   ;COM DELIVERED THE WRONG RESULT
11690  022172  022136                          R0301                   ;ERROR LOOP RETURN
11691
11692  022174  000004                  00301:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11693
```

```
11694                                   ; ********************************************************************************
11695                                          .SBTTL T0302 INC DMO TEST - <N:C> = 1011
11696                                   ; ********************************************************************************
11697
11698                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11699
11700                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11701
11702                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11703
11704                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000
11705
11706                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101
11707
11708                                   ;SYNC:          B05J2 (-) T = 1 USEC
11709
11710                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 INC L
11711
11712  022176  012700  000302           T0302:  MOV     #0302,R0                ;LOAD R0 WITH TEST NO.
11713  022202  013701  022224                   MOV     @#I0302,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11714  022206  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
11715  022212  005004                           CLR     R4              ;RESULT S / B = 000000
11716  022214  012703  177777           R0302:  MOV     #-1,R3          ;[DEST] = 177777
11717  022220  000257                           CCC                     ;CLEAR CODES
11718  022222  000273                           273                     ;N:C = 1011
11719
11720  022224  005203                   I0302:  INC     R3              ;TEST THE INC
11721
11722  022226  100403                           BMI     E10302          ;N:C = 0101 ?
11723  022230  001002                           BNE     E10302
11724  022232  102401                           BVS     E10302
11725  022234  103402                           BCS     A0302
11726
11727  022236  104005                   E10302: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
11728  022240  022214                           R0302                   ;ERROR LOOP RETURN
11729  022242  020403                   A0302:  CMP     R4,R3           ;RESULT OK ?
11730  022244  001402                           BEQ     00302           ;BR IF YES
11731
11732  022246  104000                   E20302: ERROR                   ;INC DELIVERED THE WRONG RESULT
11733  022250  022214                           R0302                   ;ERROR LOOP RETURN
11734
11735  022252  000004                   00302:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11736
```

```
11737                                   ; ***************************************************************************
11738                                         .SBTTL T0303 INC DMD TEST - <N:C> = 0100
11739                                   ; ***************************************************************************
11740
11741                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11742
11743                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11744
11745                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11746
11747                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 100000
11748
11749                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010
11750
11751                                   ;SYNC:          B05J2 (-) T = 1 USEC
11752
11753                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 INC L  /  K3-4 OVLAP INSTR H
11754
11755  022254  012700  000303          T0303:  MOV     #0303,R0                ;LOAD R0 WITH TEST NO.
11756  022260  013701  022304                  MOV     @#I0303,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11757  022264  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11758  022270  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
11759  022274  012703  077777          R0303:  MOV     #77777,R3       ;[DEST] = 77777
11760  022300  000257                          CCC                     ;CLEAR CODES
11761  022302  000264                          264                     ;N:C = 0100
11762
11763  022304  005203          I0303:  INC     R3              ;TEST THE INC
11764
11765  022306  100003                  BPL     E10303          ;N:C = 1010 ?
11766  022310  001402                  BEQ     E10303
11767  022312  102001                  BVC     E10303
11768  022314  103002                  BCC     A0303
11769
11770  022316  104005          E10303: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
11771  022320  022274                  R0303                   ;ERROR LOOP RETURN
11772  022322  020403          A0303:  CMP     R4,R3           ;RESULT OK ?
11773  022324  001402                  BEQ     O0303           ;BR IF YES
11774
11775  022326  104000          E20303: ERROR                   ;INC DELIVERED THE WRONG RESULT
11776  022330  022274                  R0303                   ;ERROR LOOP RETURN
11777
11778  022332  000004          O0303:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11779
```

```
11780                                   ; ***************************************************************************
11781                                         .SBTTL T0304 DEC DMO TEST - <N:C> = 1011
11782                                   ; ***************************************************************************
11783
11784                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11785
11786                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11787
11788                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11789
11790                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 000000
11791
11792                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101
11793
11794                                   ;SYNC:          B05J2 (-) T = 1 USEC
11795
11796                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L
11797
11798  022334  012700  000304          T0304:  MOV     #0304,R0                ;LOAD R0 WITH TEST NO.
11799  022340  013701  022362                  MOV     @#I0304,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11800  022344  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11801  022350  005004                          CLR     R4              ;RESULT S / B = 000000
11802  022352  012703  000001          R0304:  MOV     #1,R3           ;[DEST] = 1
11803  022356  000257                          CCC                     ;CLEAR CODES
11804  022360  000273                          273                     ;N:C = 1011
11805
11806  022362  005303                  I0304:  DEC     R3              ;TEST THE DEC
11807
11808  022364  100403                          BMI     E10304          ;N:C = 0101 ?
11809  022366  001002                          BNE     E10304
11810  022370  102401                          BVS     E10304
11811  022372  103402                          BCS     A0304
11812
11813  022374  104005                  E10304: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
11814  022376  022352                          R0304                   ;ERROR LOOP RETURN
11815  022400  020403                  A0304:  CMP     R4,R3           ;RESULT OK ?
11816  022402  001402                          BEQ     00304           ;BR IF YES
11817
11818  022404  104000                  E20304: ERROR                   ;DEC DELIVERED THE WRONG RESULT
11819  022406  022352                          R0304                   ;ERROR LOOP RETURN
11820
11821  022410  000004                  00304:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11822
```

```
11823                                   ; ***************************************************************************
11824                                          .SBTTL T0305 DEC DMO TEST - <N:C> = 1100
11825                                   ; ***************************************************************************
11826
11827                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11828
11829                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11830
11831                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11832
11833                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 77777
11834
11835                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0010
11836
11837                                   ;SYNC:          B05J2 (-) T = 1 USEC
11838
11839                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L
11840
11841  022412  012700  000305           T0305:  MOV     #0305,R0                ;LOAD R0 WITH TEST NO.
11842  022416  013701  022442                   MOV     @#I0305,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11843  022422  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
11844  022426  012704  077777                   MOV     #77777,R4       ;RESULT S / B = 77777
11845  022432  012703  100000           R0305:  MOV     #100000,R3      ;[DEST] = 100000
11846  022436  000257                           CCC                     ;CLEAR CODES
11847  022440  000274                           274                     ;N:C = 1100
11848
11849  022442  005303                   I0305:  DEC     R3              ;TEST THE DEC
11850
11851  022444  100403                           BMI     E10305          ;N:C = 0010 ?
11852  022446  001402                           BEQ     E10305
11853  022450  102001                           BVC     E10305
11854  022452  103002                           BCC     A0305
11855
11856  022454  104005                   E10305: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
11857  022456  022432                           R0305                   ;ERROR LOOP RETURN
11858  022460  020403                   A0305:  CMP     R4,R3           ;RESULT OK ?
11859  022462  001402                           BEQ     00305           ;BR IF YES
11860
11861  022464  104000                   E20305: ERROR                   ;DEC DELIVERED THE WRONG RESULT
11862  022466  022432                           R0305                   ;ERROR LOOP RETURN
11863
11864  022470  000004                   00305:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11865
```

```
11866                                   ; ***************************************************************************
11867                                           .SBTTL T0306 DEC DMO TEST - <N:C> = 0000
11868                                   ; ***************************************************************************
11869
11870                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11871
11872                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11873
11874                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11875
11876                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 177777
11877
11878                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1000
11879
11880                                   ;SYNC:          B05J2 (-) T = 1 USEC
11881
11882                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L
11883
11884  022472  012700  000306           T0306:  MOV     #0306,R0                ;LOAD R0 WITH TEST NO.
11885  022476  013701  022516                   MOV     @#I0306,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11886  022502  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
11887  022506  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
11888  022512  005003                   R0306:  CLR     R3              ;[DEST] = 000000
11889  022514  000257                           CCC                     ;CLEAR CODES
11890
11891  022516  005303                   I0306:  DEC     R3              ;TEST THE DEC
11892
11893  022520  100003                           BPL     E10306          ;N:C = 1000 ?
11894  022522  001402                           BEQ     E10306
11895  022524  102401                           BVS     E10306
11896  022526  103002                           BCC     A0306
11897
11898  022530  104005                   E10306: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
11899  022532  022512                           R0306                   ;ERROR LOOP RETURN
11900  022534  020403                   A0306:  CMP     R4,R3           ;RESULT OK ?
11901  022536  001402                           BEQ     00306           ;BR IF YES
11902
11903  022540  104000                   E20306: ERROR                   ;DEC DELIVERED THE WRONG RESULT
11904  022542  022512                           R0306                   ;ERROR LOOP RETURN
11905
11906  022544  000004                   00306:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11907
```

```
11908                                   ; ***************************************************************************
11909                                         .SBTTL T0307 ASL DMO TEST - <N:C> = 1000
11910                                   ; ***************************************************************************
11911
11912                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11913
11914                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11915
11916                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11917
11918                                   ;EXEC:          [104]ALUC=LHHLL :[373] D = 000000
11919
11920                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0111
11921
11922                                   ;SYNC:          B05J2 (-) T = 1 USEC
11923
11924                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
11925
11926  022546  012700  000307           T0307:  MOV     #0307,R0                ;LOAD R0 WITH TEST NO.
11927  022552  013701  022574                   MOV     @#I0307,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11928  022556  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
11929  022562  005004                           CLR     R4              ;RESULT S / B = 000000
11930  022564  012703  100000           R0307:  MOV     #100000,R3      ;[DEST] = 100000
11931  022570  000257                           CCC                     ;CLEAR CODES
11932  022572  000270                           SEN                     ;N:C = 1000
11933
11934  022574  006303                   I0307:  ASL     R3              ;TEST THE ASL
11935
11936  022576  100403                           BMI     E10307          ;N:C = 0111 ?
11937  022600  001002                           BNE     E10307
11938  022602  102001                           BVC     E10307
11939  022604  103402                           BCS     A0307
11940
11941  022606  104005                   E10307: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
11942  022610  022564                           R0307                   ;ERROR LOOP RETURN
11943  022612  020403                   A0307:  CMP     R4,R3           ;RESULT OK ?
11944  022614  001402                           BEQ     00307           ;BR IF YES
11945
11946  022616  104000                   E20307: ERROR                   ;ASL DELIVERED THE WRONG RESULT
11947  022620  022564                           R0307                   ;ERROR LOOP RETURN
11948
11949  022622  000004                   00307:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11950
```

```
11951                                   ; ***************************************************************************
11952                                           .SBTTL T0310 ASL DMD TEST - <N:C> = 0101
11953                                   ; ***************************************************************************
11954
11955                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
11956
11957                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
11958
11959                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
11960
11961                                   ;EXEC:          [104]ALUC=LHHLL :[373] D = 100000
11962
11963                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010
11964
11965                                   ;SYNC:          B05J2 (-) T = 1 USEC
11966
11967                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
11968
11969  022624  012700  000310          T0310:  MOV     #0310,R0                ;LOAD R0 WITH TEST NO.
11970  022630  013701  022654                  MOV     @#I0310,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
11971  022634  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
11972  022640  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
11973  022644  012703  040000          R0310:  MOV     #40000,R3       ;[DEST] = 40000
11974  022650  000257                          CCC                     ;CLEAR CODES
11975  022652  000265                          265                     ;N:C = 0101
11976
11977  022654  006303                  I0310:  ASL     R3              ;TEST THE ASL
11978
11979  022656  100003                          BPL     E10310          ;N:C = 1010 ?
11980  022660  001402                          BEQ     E10310
11981  022662  102001                          BVC     E10310
11982  022664  103002                          BCC     A0310
11983
11984  022666  104005                  E10310: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
11985  022670  022644                          R0310                   ;ERROR LOOP RETURN
11986  022672  020403                  A0310:  CMP     R4,R3           ;RESULT OK ?
11987  022674  001402                          BEQ     00310           ;BR IF YES
11988
11989  022676  104000                  E20310: ERROR                   ;ASL DELIVERED THE WRONG RESULT
11990  022700  022644                          R0310                   ;ERROR LOOP RETURN
11991
11992  022702  000004                  00310:  SCOPE                   ;CALL SCOPE LOOP UTILITY
11993
```

```
11994                                   ; ***************************************************************************
11995                                          .SBTTL T0311 ASL DMO TEST - <N:C> = 0010
11996                                   ; ***************************************************************************
11997
11998                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
11999
12000                                   ;ROM SEQ:        [104,373,360,001] FC 1,7,8
12001
12002                                   ;ACT BUTS:       37[004]100,104  /  31[104]360,360  /  27[373]000,001
12003
12004                                   ;EXEC:           [104]ALUC=LHHLL :[373] D = 000000
12005
12006                                   ;CODES:          [373] SPS=1, [360] SPS=3   /   N:C = 0100
12007
12008                                   ;SYNC:           B05J2 (-) T = 1 USEC
12009
12010                                   ;KEY SIG:        K3-3 DM=OL   /   K3-4 OVLAP INSTR H   /   K3-6 ROTSHF (L) L   /   K3-5 R
12011
12012  022704  012700  000311   T0311:  MOV     #0311,R0                ;LOAD R0 WITH TEST NO.
12013  022710  013701  022730           MOV     @#I0311,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12014  022714  012702  177703           MOV     #177703,R2      ;DEST ADDR = R3
12015  022720  005004                   CLR     R4              ;RESULT S  /  B = 000000
12016  022722  005003   R0311:  CLR     R3              ;[DEST] = 000000
12017  022724  000257                   CCC                     ;CLEAR CODES
12018  022726  000262                   SEV                     ;N:C = 0010
12019
12020  022730  006303   I0311:  ASL     R3              ;TEST THE ASL
12021
12022  022732  100403                   BMI     E10311          ;N:C = 0100 ?
12023  022734  001002                   BNE     E10311
12024  022736  102401                   BVS     E10311
12025  022740  103002                   BCC     A0311
12026
12027  022742  104005   E10311: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
12028  022744  022722                   R0311           ;ERROR LOOP RETURN
12029  022746  020403   A0311:  CMP     R4,R3           ;RESULT OK ?
12030  022750  001402                   BEQ     00311           ;BR IF YES
12031
12032  022752  104000   E20311: ERROR                   ;ASL DELIVERED THE WRONG RESULT
12033  022754  022722                   R0311           ;ERROR LOOP RETURN
12034
12035  022756  000004   00311:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12036
```

```
12037                                   ; ***************************************************************************
12038                                          .SBTTL T0312 ROL DMD TEST - <N:C> = 1101
12039                                   ; ***************************************************************************
12040
12041                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
12042
12043                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12044
12045                                   ;ACT BUTS:      37[004]100,104  /  31[104]360,360  /  27[373]000,001
12046
12047                                   ;EXEC:          [104]ALUC=LHHLL :[373] D = 052525
12048
12049                                   ;CODES:         [373] SPS=1, [360] SPS=3   /   N:C = 0011
12050
12051                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
12052
12053                                   ;KEY SIG:       K3-3 DM=OL   /   K3-4 OVLAP INSTR H   /   K3-6 ROTSHF (L) L   /   K3-5 R
12054                                   ;   K3-8 ROT (L) H
12055
12056  022760  012700  000312          T0312:  MOV     #0312,R0                ;LOAD R0 WITH TEST NO.
12057  022764  013701  023010                  MOV     @#I0312,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12058  022770  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12059  022774  012704  052525                  MOV     #52525,R4       ;RESULT S  /  B = 52525
12060  023000  012703  125252          R0312:  MOV     #125252,R3      ;[DEST] = 125252
12061  023004  000257                          CCC                     ;CLEAR CODES
12062  023006  000275                          275                     ;N:C = 1101
12063
12064  023010  006103                  I0312:  ROL     R3              ;TEST THE ROL
12065
12066  023012  100403                          BMI     E10312          ;N:C = 0011 ?
12067  023014  001402                          BEQ     E10312
12068  023016  102001                          BVC     E10312
12069  023020  103402                          BCS     A0312
12070
12071  023022  104005                  E10312: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
12072  023024  023000                          R0312                   ;ERROR LOOP RETURN
12073  023026  020403                  A0312:  CMP     R4,R3           ;RESULT OK ?
12074  023030  001402                          BEQ     00312           ;BR IF YES
12075
12076  023032  104000                  E20312: ERROR                   ;ROL DELIVERED THE WRONG RESULT
12077  023034  023000                          R0312                   ;ERROR LOOP RETURN
12078
12079  023036  000004                  00312:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12080
```

```
12081                                   ; ***************************************************************************
12082                                         .SBTTL T0313 ROL DMD TEST - <N:C> = 0101
12083                                   ; ***************************************************************************
12084
12085                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
12086
12087                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12088
12089                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12090
12091                                   ;EXEC:          [104]ALUC=LHHLL :[373] D = 125252
12092
12093                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010
12094
12095                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
12096
12097                                   ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
12098                                   ;  K3-8 ROT (L) H
12099
12100  023040  012700  000313          T0313:  MOV     #0313,R0                ;LOAD R0 WITH TEST NO.
12101  023044  013701  023070                  MOV     @#I0313,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12102  023050  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12103  023054  012704  125253                  MOV     #125253,R4      ;RESULT S / B = 125253
12104  023060  012703  052525          R0313:  MOV     #52525,R3       ;[DEST] = 52525
12105  023064  000257                          CCC                     ;CLEAR CODES
12106  023066  000265                          265                     ;N:C = 0101
12107
12108  023070  006103                  I0313:  ROL     R3              ;TEST THE ROL
12109
12110  023072  100003                          BPL     E10313          ;N:C = 1010 ?
12111  023074  001402                          BEQ     E10313
12112  023076  102001                          BVC     E10313
12113  023100  103002                          BCC     A0313
12114
12115  023102  104005                  E10313: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
12116  023104  023060                          R0313                   ;ERROR LOOP RETURN
12117  023106  020403                  A0313:  CMP     R4,R3           ;RESULT OK ?
12118  023110  001402                          BEQ     00313           ;BR IF YES
12119
12120  023112  104000                  E20313: ERROR                   ;ROL DELIVERED THE WRONG RESULT
12121  023114  023060                          R0313                   ;ERROR LOOP RETURN
12122
12123  023116  000004                  00313:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12124
```

```
12125                                   ; ***************************************************************************
12126                                          .SBTTL T0314 ROL DMD TEST - <N:C> = 0010
12127                                   ; ***************************************************************************
12128
12129                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12130
12131                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12132
12133                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12134
12135                                   ;EXEC:          [104]ALUC=LHHLL :[373] D = 000000
12136
12137                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100
12138
12139                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
12140
12141                                   ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
12142                                                   ;  K3-8 ROT (L) H
12143
12144  023120  012700  000314          T0314:  MOV     #0314,R0                ;LOAD R0 WITH TEST NO.
12145  023124  013701  023144                  MOV     @#I0314,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12146  023130  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12147  023134  005004                          CLR     R4              ;RESULT S / B = 000000
12148  023136  005003          R0314:  CLR     R3              ;[DEST] = 000000
12149  023140  000257                          CCC                     ;CLEAR CODES
12150  023142  000262                          SEV                     ;N:C = 0010
12151
12152  023144  006103          I0314:  ROL     R3              ;TEST THE ROL
12153
12154  023146  100403                  BMI     E10314          ;N:C = 0100 ?
12155  023150  001002                  BNE     E10314
12156  023152  102401                  BVS     E10314
12157  023154  103002                  BCC     A0314
12158
12159  023156  104005          E10314: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
12160  023160  023136                  R0314                   ;ERROR LOOP RETURN
12161  023162  020403          A0314:  CMP     R4,R3           ;RESULT OK ?
12162  023164  001402                  BEQ     00314           ;BR IF YES
12163
12164  023166  104000          E20314: ERROR                   ;ROL DELIVERED THE WRONG RESULT
12165  023170  023136                  R0314                   ;ERROR LOOP RETURN
12166
12167  023172  000004          00314:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12168
```

```
12169                                   ; ***************************************************************************
12170                                          .SBTTL T0315 ADC DMO TEST - <N:C> = 0101
12171                                   ; ***************************************************************************
12172
12173                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12174
12175                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12176
12177                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12178
12179                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 100000
12180
12181                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010
12182
12183                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
12184
12185                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L
12186
12187  023174  012700  000315          T0315:  MOV     #0315,R0                ;LOAD R0 WITH TEST NO.
12188  023200  013701  023224                  MOV     @#I0315,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12189  023204  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12190  023210  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
12191  023214  012703  077777          R0315:  MOV     #77777,R3       ;[DEST] = 77777
12192  023220  000257                          CCC                     ;CLEAR CODES
12193  023222  000265                          265                     ;N:C = 0101
12194
12195  023224  005503                  I0315:  ADC     R3              ;TEST THE ADC
12196
12197  023226  100003                          BPL     E10315          ;N:C = 1010 ?
12198  023230  001402                          BEQ     E10315
12199  023232  102001                          BVC     E10315
12200  023234  103002                          BCC     A0315
12201
12202  023236  104005                  E10315: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
12203  023240  023214                          R0315                   ;ERROR LOOP RETURN
12204  023242  020403                  A0315:  CMP     R4,R3           ;RESULT OK ?
12205  023244  001402                          BEQ     00315           ;BR IF YES
12206
12207  023246  104000                  E20315: ERROR                   ;ADC DELIVERED THE WRONG RESULT
12208  023250  023214                          R0315                   ;ERROR LOOP RETURN
12209
12210  023252  000004                  00315:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12211
```

```
12212                                   ; ***************************************************************************
12213                                          .SBTTL T0316 ADC DMO TEST - <N:C> = 1011
12214                                   ; ***************************************************************************
12215
12216                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12217
12218                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12219
12220                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12221
12222                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000
12223
12224                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101
12225
12226                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
12227
12228                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L
12229
12230  023254  012700  000316           T0316:  MOV     #0316,R0                ;LOAD R0 WITH TEST NO.
12231  023260  013701  023302                   MOV     @#I0316,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12232  023264  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
12233  023270  005004                           CLR     R4              ;RESULT S / B = 000000
12234  023272  012703  177777           R0316:  MOV     #-1,R3          ;[DEST] = 177777
12235  023276  000257                           CCC                     ;CLEAR CODES
12236  023300  000273                           273                     ;N:C = 1011
12237
12238  023302  005503                   I0316:  ADC     R3              ;TEST THE ADC
12239
12240  023304  100403                           BMI     E10316          ;N:C = 0101 ?
12241  023306  001002                           BNE     E10316
12242  023310  102401                           BVS     E10316
12243  023312  103402                           BCS     A0316
12244
12245  023314  104005                   E10316: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
12246  023316  023272                           R0316                   ;ERROR LOOP RETURN
12247  023320  020403                   A0316:  CMP     R4,R3           ;RESULT OK ?
12248  023322  001402                           BEQ     00316           ;BR IF YES
12249
12250  023324  104000                   E20316: ERROR                   ;ADC DELIVERED THE WRONG RESULT
12251  023326  023272                           R0316                   ;ERROR LOOP RETURN
12252
12253  023330  000004                   00316:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
12254                                   ; ***************************************************************************
12255                                          .SBTTL T0317 ADC DMO TEST - <N:C> = 1010
12256                                   ; ***************************************************************************
12257
12258                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12259
12260                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12261
12262                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12263
12264                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 177777
12265
12266                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1000
12267
12268                                   ;SYNC:          B05J2 (-) T = 1 USEC
12269
12270                                   ;KEY SIG:         /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L
12271
12272  023332  012700  000317          T0317:  MOV     #0317,R0                ;LOAD R0 WITH TEST NO.
12273  023336  013701  023362                  MOV     @#I0317,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12274  023342  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12275  023346  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
12276  023352  012703  177777          R0317:  MOV     #-1,R3          ;[DEST] = 177777
12277  023356  000257                          CCC                     ;CLEAR CODES
12278  023360  000272                          272                     ;N:C = 1010
12279
12280  023362  005503                  I0317:  ADC     R3              ;TEST THE ADC
12281
12282  023364  100003                          BPL     E10317          ;N:C = 1000 ?
12283  023366  001402                          BEQ     E10317
12284  023370  102401                          BVS     E10317
12285  023372  103002                          BCC     A0317
12286
12287  023374  104005                  E10317: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
12288  023376  023352                          R0317                   ;ERROR LOOP RETURN
12289  023400  020403                  A0317:  CMP     R4,R3           ;RESULT OK ?
12290  023402  001402                          BEQ     00317           ;BR IF YES
12291
12292  023404  104000                  E20317: ERROR                   ;ADC DELIVERED THE WRONG RESULT
12293  023406  023352                          R0317                   ;ERROR LOOP RETURN
12294
12295  023410  000004                  00317:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12296
```

```
12297                                   ; ***************************************************************************
12298                                           .SBTTL T0320 SBC DMO TEST - <N:C> = 1011
12299                                   ; ***************************************************************************
12300
12301                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12302
12303                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12304
12305                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12306
12307                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 000000
12308
12309                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100
12310
12311                                   ;SYNC:          B05J2 (-) T = 1 USEC
12312
12313                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L
12314
12315  023412  012700  000320          T0320:  MOV     #0320,R0                ;LOAD R0 WITH TEST NO.
12316  023416  013701  023440                  MOV     @#I0320,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12317  023422  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12318  023426  005004                          CLR     R4              ;RESULT S / B = 000000
12319  023430  012703  000001          R0320:  MOV     #1,R3           ;[DEST0321
12320  023434  000257                          CCC                     ;CLEAR CODES
12321  023436  000273                          273                     ;N:C = 1011
12322
12323  023440  005603                  I0320:  SBC     R3              ;TEST THE SBC
12324
12325  023442  100403                          BMI     E10320          ;N:C = 0100 ?
12326  023444  001002                          BNE     E10320
12327  023446  102401                          BVS     E10320
12328  023450  103002                          BCC     A0320
12329
12330  023452  104005                  E10320: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
12331  023454  023430                          R0320                   ;ERROR LOOP RETURN
12332  023456  020403                  A0320:  CMP     R4,R3           ;RESULT OK ?
12333  023460  001402                          BEQ     00320           ;BR IF YES
12334
12335  023462  104000                  E20320: ERROR                   ;SBC DELIVERED THE WRONG RESULT
12336  023464  023430                          R0320                   ;ERROR LOOP RETURN
12337
12338  023466  000004                  00320:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12339
```

```
12340                                   ; ***************************************************************************
12341                                           .SBTTL T0321 SBC DMO TEST - <N:C> = 0101
12342                                   ; ***************************************************************************
12343
12344                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12345
12346                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12347
12348                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12349
12350                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 077777
12351
12352                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0010
12353
12354                                   ;SYNC:          B05J2 (-) T = 1 USEC
12355
12356                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L
12357
12358  023470  012700  000321          T0321:  MOV     #0321,R0                ;LOAD R0 WITH TEST NO.
12359  023474  013701  023520                  MOV     @#I0321,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12360  023500  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12361  023504  012704  077777                  MOV     #077777,R4      ;RESULT S / B = 077777
12362  023510  012703  100000          R0321:  MOV     #100000,R3      ;[DEST] = 100000
12363  023514  000257                          CCC                     ;CLEAR CODES
12364  023516  000265                          265                     ;N:C = 0101
12365
12366  023520  005603                  I0321:  SBC     R3              ;TEST THE SBC
12367
12368  023522  100403                          BMI     E10321          ;N:C = 0010 ?
12369  023524  001402                          BEQ     E10321
12370  023526  102001                          BVC     E10321
12371  023530  103002                          BCC     A0321
12372
12373  023532  104005                  E10321: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
12374  023534  023510                          R0321                   ;ERROR LOOP RETURN
12375  023536  020403                  A0321:  CMP     R4,R3           ;RESULT OK ?
12376  023540  001402                          BEQ     00321           ;BR IF YES
12377
12378  023542  104000                  E20321: ERROR                   ;SBC DELIVERED THE WRONG RESULT
12379  023544  023510                          R0321                   ;ERROR LOOP RETURN
12380
12381  023546  000004                  00321:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12382
```

```
12383                                   ; ***************************************************************************
12384                                          .SBTTL T0322 SBC DMO TEST - <N:C> = 1110
12385                                   ; ***************************************************************************
12386
12387                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12388
12389                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12390
12391                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12392
12393                                   ;EXEC:          [104]ALUC=LLLLL :[373] D = 000001
12394
12395                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0000
12396
12397                                   ;SYNC:          B05J2 (-) T = 1 USEC
12398
12399                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L
12400
12401  023550  012700  000322          T0322:  MOV     #0322,R0                ;LOAD R0 WITH TEST NO.
12402  023554  013701  023600                  MOV     @#I0322,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12403  023560  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12404  023564  012704  000001                  MOV     #1,R4           ;RESULT S / B = 1
12405  023570  012703  000001          R0322:  MOV     #1,R3           ;[DEST] = 1
12406  023574  000257                          CCC                     ;CLEAR CODES
12407  023576  000276                          276                     ;N:C = 1110
12408
12409  023600  005603                  I0322:  SBC     R3              ;TEST THE SBC
12410
12411  023602  100403                          BMI     E10322          ;N:C = 0000 ?
12412  023604  001402                          BEQ     E10322
12413  023606  102401                          BVS     E10322
12414  023610  103002                          BCC     A0322
12415
12416  023612  104005                  E10322: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
12417  023614  023570                          R0322                   ;ERROR LOOP RETURN
12418  023616  020403                  A0322:  CMP     R4,R3           ;RESULT OK ?
12419  023620  001402                          BEQ     00322           ;BR IF YES
12420
12421  023622  104000                  E20322: ERROR                   ;SBC DELIVERED THE WRONG RESULT
12422  023624  023570                          R0322                   ;ERROR LOOP RETURN
12423
12424  023626  000004                  00322:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
12425                                   ; ***************************************************************************
12426                                           .SBTTL T0323 SBC DMO TEST - <N:C> = 0111
12427                                   ; ***************************************************************************
12428
12429                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12430
12431                                   ;ROM SEQ:       [104,373,360,001] FC 1,7,8
12432
12433                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001
12434
12435                                   ;EXEC:          [104]ALUC=LHHHH :[373] D = 177777
12436
12437                                   ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C 1001
12438
12439                                   ;SYNC:          B05J2 (-) T = 1 USEC
12440
12441                                   ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L
12442
12443  023630  012700  000323          T0323:  MOV     #0323,R0                ;LOAD R0 WITH TEST NO.
12444  023634  013701  023656                  MOV     @#I0323,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12445  023640  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
12446  023644  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
12447  023650  005003                  R0323:  CLR     R3              ;[DEST] = 000000
12448  023652  000257                          CCC                     ;CLEAR CODES
12449  023654  000267                          267                     ;N:C = 0111
12450
12451  023656  005603                  I0323:  SBC     R3              ;TEST THE SBC
12452
12453  023660  100003                          BPL     E10323          ;N:C = 1001 ?
12454  023662  001402                          BEQ     E10323
12455  023664  102401                          BVS     E10323
12456  023666  103402                          BCS     A0323
12457
12458  023670  104005                  E10323: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
12459  023672  023650                          R0323                   ;ERROR LOOP RETURN
12460  023674  020403                  A0323:  CMP     R4,R3           ;RESULT OK ?
12461  023676  001402                          BEQ     00323           ;BR IF YES
12462
12463  023700  104000                  E20323: ERROR                   ;SBC DELIVERED THE WRONG RESULT
12464  023702  023650                          R0323                   ;ERROR LOOP RETURN ADDRESS
12465
12466  023704  000004                  00323:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
12467
```

```
12468                                   ; ***************************************************************************
12469                                          .SBTTL T0324 TST DM1 TEST - <N:C> = 1011
12470                                   ; ***************************************************************************
12471
12472                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12473
12474                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12475
12476                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12477
12478                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 000000
12479
12480                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
12481
12482                                   ;SYNC:          B05J2 (-) T = 2 USEC
12483
12484                                   ;KEY SIG:       K3-3 DM=1L  / K3-4 TST L  /  K1-7 D(15:00)=0 H
12485
12486  023706  012700  000324          T0324:  MOV     #0324,R0                ;LOAD R0 WITH TEST NO.
12487  023712  013701  023732                  MOV     @#I0324,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12488  023716  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12489  023722  005004                          CLR     R4              ;RESULT S / B = 000000
12490  023724  005012                  R0324:  CLR     (R2)            ;[DEST] = 000000
12491  023726  000257                          CCC                     ;CLEAR CODES
12492  023730  000273                          273                     ;N:C=1011
12493
12494  023732  005712                  I0324:  TST     (R2)            ;TEST THE TST
12495
12496  023734  100403                          BMI     E10324          ;N:C = 0100 ?
12497  023736  001002                          BNE     E10324
12498  023740  102401                          BVS     E10324
12499  023742  103002                          BCC     A0324
12500
12501  023744  104005                  E10324: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
12502  023746  023724                          R0324                   ;ERROR LOOP RETURN
12503
12504  023750  020412                  A0324:  CMP     R4,(R2)         ;RESULT OK ?
12505  023752  001403                          BEQ     00324           ;BR IF YES
12506
12507  023754  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12508  023756  104000                  E20324: ERROR                   ;TST ALTERED THE [DEST]
12509  023760  023724                          R0324                   ;ERROR LOOP RETURN
12510
12511  023762  000004                  00324:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12512
12513
```

```
12514                                   ; ***************************************************************************
12515                                   ;       .SBTTL T0325 TST DM1 TEST - <N:C> = 0100
12516                                   ; ***************************************************************************
12517
12518                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12519
12520                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12521
12522                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12523
12524                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 177777
12525
12526                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1000
12527
12528                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
12529
12530                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 TST L
12531
12532  023764  012700  000325          T0325:  MOV     #0325,R0                ;LOAD R0 WITH TEST NO.
12533  023770  013701  024014                  MOV     @#I0325,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12534  023774  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12535  024000  005004                          CLR     R4
12536  024002  005104                          COM     R4              ;RESULT S / B = 177777
12537  024004  012712  177777          R0325:  MOV     #-1,(R2)        ;[DEST] = 177777
12538  024010  000257                          CCC                     ;CLEAR CODES
12539  024012  000264                          264                     ;N:C=0100
12540
12541  024014  005712                  I0325:  TST     (R2)            ;TEST THE TST
12542
12543  024016  100003                          BPL     E10325          ;N:C = 1000 ?
12544  024020  001402                          BEQ     E10325
12545  024022  102401                          BVS     E10325
12546  024024  103002                          BCC     A0325
12547
12548  024026  104005                  E10325: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
12549  024030  024004                          R0325                   ;ERROR LOOP RETURN
12550
12551  024032  020412                  A0325:  CMP     R4,(R2)         ;RESULT OK ?
12552  024034  001403                          BEQ     00325           ;BR IF YES
12553
12554  024036  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12555  024040  104000                  E20325: ERROR                   ;TST ALTERED THE [DEST]
12556  024042  024004                          R0325                   ;ERROR LOOP RETURN
12557
12558  024044  000004                  00325:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12559
```

```
12560                                   ; ***************************************************************************
12561                                          .SBTTL T0326 CLR DM1 TEST - (N:C) = 1011
12562                                   ; ***************************************************************************
12563
12564                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12565
12566                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12567
12568                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12569
12570                                   ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000
12571
12572                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
12573
12574                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
12575
12576                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 CLR L
12577
12578  024046  012700  000326          T0326:  MOV     #0326,R0                ;LOAD R0 WITH TEST NO.
12579  024052  013701  024074                  MOV     @#I0326,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12580  024056  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12581  024062  005004                          CLR     R4              ;RESULT S / B = 000000
12582  024064  012712  177777          R0326:  MOV     #-1,(R2)        ;[DEST] = 177777
12583  024070  000257                          CCC                     ;CLEAR CODES
12584  024072  000273                          273                     ;N:C = 1011
12585
12586  024074  005012                  I0326:  CLR     (R2)            ;TEST THE CLR
12587
12588  024076  100403                          BMI     E10326          ;N:C = 0100 ?
12589  024100  001002                          BNE     E10326
12590  024102  102401                          BVS     E10326
12591  024104  103002                          BCC     A0326
12592
12593  024106  104005                  E10326: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
12594  024110  024064                          R0326                   ;ERROR LOOP RETURN
12595  024112  020412                  A0326:  CMP     R4,(R2)         ;RESULT OK ?
12596  024114  001403                          BEQ     00326           ;BR IF YES
12597
12598  024116  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12599  024120  104000                  E20326: ERROR                   ;CLR DELIVERED THE WRONG RESULT
12600  024122  024064                          R0326                   ;ERROR LOOP RETURN
12601
12602  024124  000004                  00326:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12603
```

```
12604                                   ; ***************************************************************************
12605                                           .SBTTL T0327 CLR DM2 TEST - <N:C> = 0000
12606                                   ; ***************************************************************************
12607
12608                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12609
12610                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12611
12612                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12613
12614                                   ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000
12615
12616                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
12617
12618                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
12619
12620                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 CLR L
12621
12622  024126  012700  000327          T0327:  MOV     #0327,R0                ;LOAD R0 WITH TEST NO.
12623  024132  013701  024152                  MOV     @#I0327,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12624  024136  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12625  024142  005004                          CLR     R4              ;RESULT S / B = 000000
12626  024144  013712  067614          R0327:  MOV     @#DWTA+2,(R2)   ;[DEST] = 177777
12627  024150  000257                          CCC                     ;CLEAR CODES
12628
12629  024152  005022                  I0327:  CLR     (R2)+           ;TEST THE CLR
12630
12631  024154  100403                          BMI     E10327          ;N:C = 0100 ?
12632  024156  001002                          BNE     E10327
12633  024160  102401                          BVS     E10327
12634  024162  103002                          BCC     A0327
12635
12636  024164  104005                  E10327: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
12637  024166  024144                          R0327                   ;ERROR LOOP RETURN
12638  024170  022702  067604          A0327:  CMP     #MBUF0+2,R2     ;DID CLR INCREMENT DEST REG
12639  024174  001402                          BEQ     B0327           ;BR IF YES
12640
12641  024176  104005                  E20327: ERROR5                  ;CLR FAILED TO UPDATE DEST REG
12642  024200  024144                          R0327                   ;ERROR LOOP RETURN
12643
12644  024202  020442                  B0327:  CMP     R4,-(R2)                ;RESULT OK ?
12645  024204  001403                          BEQ     00327           ;BR IF YES
12646
12647  024206  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12648  024210  104000                  E30327: ERROR                   ;CLR DELIVERED THE WRONG RESULT
12649  024212  024144                          R0327                   ;ERROR LOOP RETURN
12650
12651  024214  000004                  00327:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12652
```

```
12653                                   ; ***************************************************************************
12654                                          .SBTTL T0330 COM DM1 TEST - <N:C> = 0110
12655                                   ; ***************************************************************************
12656
12657                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12658
12659                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12660
12661                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12662
12663                                   ;EXEC:          [220]ALUC=HLLLL :[211] D = 125252
12664
12665                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C=1001
12666
12667                                   ;SYNC:          BO5J2 (-) T = 2 USEC
12668
12669                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 COM L
12670
12671  024216  012700  000330          T0330:  MOV     #0330,R0                ;LOAD R0 WITH TEST NO.
12672  024222  013701  024246                  MOV     @#I0330,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12673  024226  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12674  024232  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
12675  024236  012712  052525          R0330:  MOV     #52525,(R2)     ;[DEST] = 52525
12676  024242  000257                          CCC                     ;CLEAR CODES
12677  024244  000266                          266                     ;N:C = 0110
12678
12679  024246  005112                  I0330:  COM     (R2)            ;TEST THE CLR
12680
12681  024250  100003                          BPL     E10330          ;N:C = 1001 ?
12682  024252  001402                          BEQ     E10330
12683  024254  102401                          BVS     E10330
12684  024256  103402                          BCS     A0330
12685
12686  024260  104005                  E10330: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
12687  024262  024236                          R0330                   ;ERROR LOOP RETURN
12688  024264  020412                  A0330:  CMP     R4,(R2)         ;RESULT OK ?
12689  024266  001403                          BEQ     00330           ;BR IF YES
12690
12691  024270  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12692  024272  104000                  E20330: ERROR                   ;COM DELIVERED THE WRONG RESULT
12693  024274  024236                          R0330                   ;ERROR LOOP RETURN
12694
12695  024276  000004                  00330:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12696
12697
```

```
12698                                   ; ***************************************************************************
12699                                          .SBTTL T0331 COM DM1 TEST - <N:C> = 1001
12700                                   ; ***************************************************************************
12701
12702                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12703
12704                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12705
12706                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12707
12708                                   ;EXEC:          [220]ALUC=HLLLL :[211] D = 000000
12709
12710                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101
12711
12712                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
12713
12714                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 COM L
12715
12716  024300  012700  000331          T0331:  MOV     #0331,R0            ;LOAD R0 WITH TEST NO.
12717  024304  013701  024326                  MOV     @#I0331,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12718  024310  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12719  024314  005004                          CLR     R4              ;RESULT S / B = 000000
12720  024316  012712  177777          R0331:  MOV     #-1,(R2)        ;[DEST] = 177777
12721  024322  000257                          CCC                     ;CLEAR CODES
12722  024324  000271                          271                     ;N:C = 1001
12723
12724  024326  005112                  I0331:  COM     (R2)            ;TEST THE COM
12725
12726  024330  100403                          BMI     E10331          ;N:C = 0101 ?
12727  024332  001002                          BNE     E10331
12728  024334  102401                          BVS     E10331
12729  024336  103402                          BCS     A0331
12730
12731  024340  104005                  E10331: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
12732  024342  024316                          R0331                   ;ERROR LOOP RETURN
12733  024344  020412                  A0331:  CMP     R4,(R2)         ;RESULT OK ?
12734  024346  001403                          BEQ     00331           ;BR IF YES
12735
12736  024350  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12737  024352  104000                  E20331: ERROR                   ;COM DELIVERED THE WRONG RESULT
12738  024354  024316                          R0331                   ;ERROR LOOP RETURN
12739
12740  024356  000004                  00331:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12741
```

```
12742                                   ; ***************************************************************************
12743                                         .SBTTL T0332 INC DM1 TEST - <N:C> = 1011
12744                                   ; ***************************************************************************
12745
12746                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12747
12748                                   ;ROM SEQ:       [161,266,267,220,211,367,275,016] FC 1,3,9,8
12749
12750                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12751
12752                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 000000
12753
12754                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101
12755
12756                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
12757
12758                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 INC L  /  K3-8 CIN00 L
12759
12760  024360  012700  000332          T0332:  MOV     #0332,R0                ;LOAD R0 WITH TEST NO.
12761  024364  013701  024406                  MOV     @#I0332,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12762  024370  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12763  024374  005004                          CLR     R4              ;RESULT S / B = 000000
12764  024376  012712  177777          R0332:  MOV     #-1,(R2)                ;[DEST] = 177777
12765  024402  000257                          CCC                     ;CLEAR CODES
12766  024404  000273                          273                     ;N:C = 1011
12767
12768  024406  005212                  I0332:  INC     (R2)            ;TEST THE INC
12769
12770  024410  100403                          BMI     E10332          ;N:C = 0101 ?
12771  024412  001002                          BNE     E10332
12772  024414  102401                          BVS     E10332
12773  024416  103402                          BCS     A0332
12774
12775  024420  104005                  E10332: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
12776  024422  024376                          R0332                   ;ERROR LOOP RETURN
12777  024424  020412                  A0332:  CMP     R4,(R2)         ;RESULT OK ?
12778  024426  001403                          BEQ     00332           ;BR IF YES
12779
12780  024430  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12781  024432  104000                  E20332: ERROR                   ;INC DELIVERED THE WRONG RESULT
12782  024434  024376                          R0332                   ;ERROR LOOP RETURN
12783
12784  024436  000004                  00332:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12785
```

```
12786                                   ; ********************************************************************************
12787                                          .SBTTL T0333 INC DM1 TEST - <N:C> = 0100
12788                                   ; ********************************************************************************
12789
12790                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12791
12792                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12793
12794                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12795
12796                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 100000
12797
12798                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010
12799
12800                                   ;SYNC:          B05J2 (-) T = 2 USEC
12801
12802                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 INC L  /  K3-8 CIN00 L
12803
12804  024440  012700  000333          T0333:  MOV     #0333,R0                ;LOAD R0 WITH TEST NO.
12805  024444  013701  024470                  MOV     @#I0333,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12806  024450  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12807  024454  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
12808  024460  012712  077777          R0333:  MOV     #77777,(R2)     ;[DEST] = 77777
12809  024464  000257                          CCC                     ;CLEAR CODES
12810  024466  000264                          264                     ;N:C = 0100
12811
12812  024470  005212                  I0333:  INC     (R2)            ;TEST THE INC
12813
12814  024472  100003                          BPL     E10333          ;N:C = 1010 ?
12815  024474  001402                          BEQ     E10333
12816  024476  102001                          BVC     E10333
12817  024500  103002                          BCC     A0333
12818
12819  024502  104005                  E10333: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
12820  024504  024460                          R0333                   ;ERROR LOOP RETURN
12821  024506  020412                  A0333:  CMP     R4,(R2)         ;RESULT OK ?
12822  024510  001403                          BEQ     00333           ;BR IF YES
12823
12824  024512  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12825  024514  104000                  E20333: ERROR                   ;INC DELIVERED THE WRONG RESULT
12826  024516  024460                          R0333                   ;ERROR LOOP RETURN
12827
12828  024520  000004                  00333:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12829
```

```
12830                                   ; ***************************************************************************
12831                                         .SBTTL T0334 DEC DM1 TEST - <N:C> = 1011
12832                                   ; ***************************************************************************
12833
12834                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12835
12836                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12837
12838                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12839
12840                                   ;EXEC:          [220]ALUC=LHHHH :[211] D = 000000
12841
12842                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101
12843
12844                                   ;SYNC:          B05J2 (-) T = 2 USEC
12845
12846                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L
12847
12848  024522  012700  000334           T0334:  MOV     #0334,R0                ;LOAD R0 WITH TEST NO.
12849  024526  013701  024562                   MOV     @#I0334,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12850  024532  032737  000100  066642           BIT     #100,@#BPTLOC   ;BREAKPOINT HALT SET
12851  024540  001401                           BEQ     .+4             ;BR IF NOT
12852  024542  000000                           HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
12853  024544  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12854  024550  005004                           CLR     R4              ;RESULT S / B = 000000
12855  024552  012712  000001           R0334:  MOV     #1,(R2)         ;[DEST] = 1
12856  024556  000257                           CCC                     ;CLEAR CODES
12857  024560  000273                           273                     ;N:C = 1011
12858
12859  024562  005312                   I0334:  DEC     (R2)            ;TEST THE DEC
12860
12861  024564  100403                           BMI     E10334          ;N:C = 0101 ?
12862  024566  001002                           BNE     E10334
12863  024570  102401                           BVS     E10334
12864  024572  103402                           BCS     A0334
12865
12866  024574  104005                   E10334: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
12867  024576  024552                           R0334                   ;ERROR LOOP RETURN
12868  024600  020412                   A0334:  CMP     R4,(R2)         ;RESULT OK ?
12869  024602  001403                           BEQ     00334           ;BR IF YES
12870
12871  024604  011203                           MOV     (R2),R3         ;GET THE WAS DATA
12872  024606  104000                   E20334: ERROR                   ;DEC DELIVERED THE WRONG RESULT
12873  024610  024552                           R0334                   ;ERROR LOOP RETURN
12874
12875  024612  000004                   00334:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12876
```

```
12877                                   ; ***************************************************************************
12878                                          .SBTTL T0335 DEC DM1 TEST - <N:C> = 1100
12879                                   ; ***************************************************************************
12880
12881                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12882
12883                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12884
12885                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12886
12887                                   ;EXEC:          [220]ALUC=LHHHH :[211] D = 77777
12888
12889                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0010
12890
12891                                   ;SYNC:          BO5J2 (-) T = 2 USEC
12892
12893                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L
12894
12895  024614  012700  000335           T0335:  MOV     #0335,R0                ;LOAD R0 WITH TEST NO.
12896  024620  013701  024644                   MOV     @#I0335,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12897  024624  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12898  024630  012704  077777                   MOV     #77777,R4       ;RESULT S / B = 77777
12899  024634  012712  100000           R0335:  MOV     #100000,(R2)    ;[DEST] = 100000
12900  024640  000257                           CCC                     ;CLEAR CODES
12901  024642  000274                           274                     ;N:C = 1100
12902
12903  024644  005312                   I0335:  DEC     (R2)            ;TEST THE DEC
12904
12905  024646  100403                           BMI     E10335          ;N:C = 0010 ?
12906  024650  001402                           BEQ     E10335
12907  024652  102001                           BVC     E10335
12908  024654  103002                           BCC     A0335
12909
12910  024656  104005                   E10335: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
12911  024660  024634                           R0335                   ;ERROR LOOP RETURN
12912  024662  020412                   A0335:  CMP     R4,(R2)         ;RESULT OK ?
12913  024664  001403                           BEQ     00335           ;BR IF YES
12914
12915  024666  011203                           MOV     (R2),R3         ;GET THE WAS DATA
12916  024670  104000                   E20335: ERROR                   ;DEC DELIVERED THE WRONG RESULT
12917  024672  024634                           R0335                   ;ERROR LOOP RETURN
12918
12919  024674  000004                   00335:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12920
```

```
12921                                   ; ***************************************************************************
12922                                          .SBTTL T0336 DEC DM1 TEST - <N:C> = 0000
12923                                   ; ***************************************************************************
12924
12925                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12926
12927                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12928
12929                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12930
12931                                   ;EXEC:          [220]ALUC=LHHHH :[211] D = 177777
12932
12933                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C 1000
12934
12935                                   ;SYNC:          B05J2 (-) T = 2 USEC
12936
12937                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L
12938
12939  024676  012700  000336          T0336:  MOV     #0336,R0                ;LOAD R0 WITH TEST NO.
12940  024702  013701  024722                  MOV     @#I0336,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12941  024706  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12942  024712  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
12943  024716  005012                  R0336:  CLR     (R2)            ;[DEST] = 000000
12944  024720  000257                          CCC                     ;CLEAR CODES
12945
12946  024722  005312                  I0336:  DEC     (R2)            ;TEST THE DEC
12947
12948  024724  100003                          BPL     E10336          ;N:C = 1000 ?
12949  024726  001402                          BEQ     E10336
12950  024730  102401                          BVS     E10336
12951  024732  103002                          BCC     A0336
12952
12953  024734  104005                  E10336: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
12954  024736  024716                          R0336                   ;ERROR LOOP RETURN
12955  024740  020412                  A0336:  CMP     R4,(R2)         ;RESULT OK ?
12956  024742  001403                          BEQ     00336           ;BR IF YES
12957
12958  024744  011203                          MOV     (R2),R3         ;GET THE WAS DATA
12959  024746  104000                  E20336: ERROR                   ;DEC DELIVERED THE WRONG RESULT
12960  024750  024716                          R0336                   ;ERROR LOOP RETURN
12961
12962  024752  000004                  00336:  SCOPE                   ;CALL SCOPE LOOP UTILITY
12963
```

```
12964                                   ; ***************************************************************************
12965                                          .SBTTL T0337 ASL DM1 TEST - <N:C> = 1000
12966                                   ; ***************************************************************************
12967
12968                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
12969
12970                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
12971
12972                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
12973
12974                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000
12975
12976                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0111
12977
12978                                   ;SYNC:          B05J2 (-) T = 2 USEC
12979
12980                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H
12981
12982  024754  012700  000337           T0337:  MOV     #0337,R0                ;LOAD R0 WITH TEST NO.
12983  024760  013701  025002                   MOV     @#I0337,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
12984  024764  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
12985  024770  005004                           CLR     R4              ;RESULT S / B = 000000
12986  024772  012712  100000           R0337:  MOV     #100000,(R2)    ;[DEST] = 100000
12987  024776  000257                           CCC                     ;CLEAR CODES
12988  025000  000270                           SEN                     ;N:C = 1000
12989
12990  025002  006312           I0337:  ASL     (R2)            ;TEST THE ASL
12991
12992  025004  100403                   BMI     E10337          ;N:C = 0111 ?
12993  025006  001002                   BNE     E10337
12994  025010  102001                   BVC     E10337
12995  025012  103402                   BCS     A0337
12996
12997  025014  104005           E10337: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
12998  025016  024772                   R0337                   ;ERROR LOOP RETURN
12999  025020  020412           A0337:  CMP     R4,(R2)         ;RESULT OK ?
13000  025022  001403                   BEQ     00337           ;BR IF YES
13001
13002  025024  011203                   MOV     (R2),R3         ;GET THE WAS DATA
13003  025026  104000           E20337: ERROR                   ;ASL DELIVERED THE WRONG RESULT
13004  025030  024772                   R0337                   ;ERROR LOOP RETURN
13005
13006  025032  000004           00337:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13007
```

```
13008                                   ; ***************************************************************************
13009                                          .SBTTL T0340 ASL DM1 TEST - <N:C> = 0101
13010                                   ; ***************************************************************************
13011
13012                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13013
13014                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13015
13016                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13017
13018                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 100000
13019
13020                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010
13021
13022                                   ;SYNC:          B05J2 (-) T = 2 USEC
13023
13024                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H
13025
13026  025034  012700  000340          T0340:  MOV     #0340,R0                ;LOAD R0 WITH TEST NO.
13027  025040  013701  025064                  MOV     @#I0340,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13028  025044  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13029  025050  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
13030  025054  012712  040000          R0340:  MOV     #40000,(R2)     ;[DEST] = 40000
13031  025060  000257                          CCC                     ;CLEAR CODES
13032  025062  000265                          265                     ;N:C = 0101
13033
13034  025064  006312                  I0340:  ASL     (R2)            ;TEST THE ASL
13035
13036  025066  100003                          BPL     E10340          ;N:C = 1010 ?
13037  025070  001402                          BEQ     E10340
13038  025072  102001                          BVC     E10340
13039  025074  103002                          BCC     A0340
13040
13041  025076  104005                  E10340: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
13042  025100  025054                          R0340                   ;ERROR LOOP RETURN
13043  025102  020412                  A0340:  CMP     R4,(R2)         ;RESULT OK ?
13044  025104  001403                          BEQ     00340           ;BR IF YES
13045
13046  025106  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13047  025110  104000                  E20340: ERROR                   ;ASL DELIVERED THE WRONG RESULT
13048  025112  025054                          R0340                   ;ERROR LOOP RETURN
13049
13050  025114  000004                  00340:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13051
```

```
13052                                   ; ***************************************************************************
13053                                          .SBTTL T0341 ASL DM1 TEST - <N:C> = 0010
13054                                   ; ***************************************************************************
13055
13056                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13057
13058                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13059
13060                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13061
13062                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000
13063
13064                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
13065
13066                                   ;SYNC:          B05J2 (-) T = 2 USEC
13067
13068                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF F
13069
13070  025116  012700  000341          T0341:  MOV     #0341,R0                ;LOAD R0 WITH TEST NO.
13071  025122  013701  025142                  MOV     @#I0341,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13072  025126  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13073  025132  005004                          CLR     R4              ;RESULT S / B = 000000
13074  025134  005012                  R0341:  CLR     (R2)            ;[DEST] = 000000
13075  025136  000257                          CCC                     ;CLEAR CODES
13076  025140  000262                          SEV                     ;N:C = 0010
13077
13078  025142  006312                  I0341:  ASL     (R2)            ;TEST THE ASL
13079
13080  025144  100403                          BMI     E10341          ;N:C = 0100 ?
13081  025146  001002                          BNE     E10341
13082  025150  102401                          BVS     E10341
13083  025152  103002                          BCC     A0341
13084
13085  025154  104005                  E10341: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
13086  025156  025134                          R0341                   ;ERROR LOOP RETURN
13087  025160  020412                  A0341:  CMP     R4,(R2)         ;RESULT OK ?
13088  025162  001403                          BEQ     00341           ;BR IF YES
13089
13090  025164  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13091  025166  104000                  E20341: ERROR                   ;ASL DELIVERED THE WRONG RESULT
13092  025170  025134                          R0341                   ;ERROR LOOP RETURN
13093
13094  025172  000004                  00341:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13095
```

```
13096                                   ; ***************************************************************************
13097                                         .SBTTL T0342 ROL DM1 TEST - <N:C> = 1101
13098                                   ; ***************************************************************************
13099
13100                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13101
13102                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13103
13104                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13105
13106                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 052525
13107
13108                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0011
13109
13110                                   ;SYNC:          B05J2 (-) T = 2 USEC
13111
13112                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H
13113
13114  025174  012700  000342          T0342:  MOV     #0342,R0                ;LOAD R0 WITH TEST NO.
13115  025200  013701  025224                  MOV     @#I0342,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13116  025204  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13117  025210  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
13118  025214  012712  125252          R0342:  MOV     #125252,(R2)    ;[DEST] = 125252
13119  025220  000257                          CCC                     ;CLEAR CODES
13120  025222  000275                          275                     ;N:C = 1101
13121
13122  025224  006112                  I0342:  ROL     (R2)            ;TEST THE ROL
13123
13124  025226  100403                          BMI     E10342          ;N:C = 0011 ?
13125  025230  001402                          BEQ     E10342
13126  025232  102001                          BVC     E10342
13127  025234  103402                          BCS     A0342
13128
13129  025236  104005                  E10342: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
13130  025240  025214                          R0342                   ;ERROR LOOP RETURN
13131  025242  020412                  A0342:  CMP     R4,(R2)         ;RESULT OK ?
13132  025244  001403                          BEQ     00342           ;BR IF YES
13133
13134  025246  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13135  025250  104000                  E20342: ERROR                   ;ROL DELIVERED THE WRONG RESULT
13136  025252  025214                          R0342                   ;ERROR LOOP RETURN
13137
13138  025254  000004                  00342:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13139
```

```
13140                                   ; ***************************************************************************
13141                                          .SBTTL T0343 ROL DM1 TEST - <N:C> = 0101
13142                                   ; ***************************************************************************
13143
13144                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13145
13146                                   ;ROM SEQ:       [161,266,267,220,211,367,075,016] FC 1,3,9,8
13147
13148                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13149
13150                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 125253
13151
13152                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010
13153
13154                                   ;SYNC:          BG5J2 (-) T = 2 USEC
13155
13156                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H
13157
13158  025256  012700  000343          T0343:  MOV     #0343,R0                ;LOAD R0 WITH TEST NO.
13159  025262  013701  025306                  MOV     @#I0343,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13160  025266  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13161  025272  012704  125253                  MOV     #125253,R4      ;RESULT S / B = 125253
13162  025276  012712  052525          R0343:  MOV     #52525,(R2)     ;[DEST] = 52525
13163  025302  000257                          CCC                     ;CLEAR CODES
13164  025304  000265                          265                     ;N:C = 0101
13165
13166  025306  006112                  I0343:  ROL     (R2)            ;TEST THE ROL
13167
13168  025310  100003                          BPL     E10343          ;N:C = 1010 ?
13169  025312  001402                          BEQ     E10343
13170  025314  102001                          BVC     E10343
13171  025316  103002                          BCC     A0343
13172
13173  025320  104005                  E10343: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
13174  025322  025276                          R0343                   ;ERROR LOOP RETURN
13175  025324  020412                  A0343:  CMP     R4,(R2)         ;RESULT OK ?
13176  025326  001403                          BEQ     00343           ;BR IF YES
13177
13178  025330  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13179  025332  104000                  E20343: ERROR                   ;ROL DELIVERED THE WRONG RESULT
13180  025334  025276                          R0343                   ;ERROR LOOP RETURN
13181
13182  025336  000004                  00343:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13183
```

```
13184                                   ; ***************************************************************************
13185                                         .SBTTL T0344 ROL DMI TEST - <N:C> = 0010
13186                                   ; ***************************************************************************
13187
13188                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13189
13190                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13191
13192                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13193
13194                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000
13195
13196                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C =0100
13197
13198                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
13199
13200                                   ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H
13201
13202  025340  012700  000344          T0344:  MOV     #0344,R0                ;LOAD R0 WITH TEST NO.
13203  025344  013701  025364                  MOV     @#I0344,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13204  025350  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13205  025354  005004                          CLR     R4              ;RESULT S / B = 000000
13206  025356  005012                  R0344:  CLR     (R2)            ;[DEST] = 000000
13207  025360  000257                          CCC                     ;CLEAR CODES
13208  025362  000262                          SEV                     ;N:C = 0010
13209
13210  025364  006112                  I0344:  ROL     (R2)            ;TEST THE ROL
13211
13212  025366  100403                          BMI     E10344          ;N:C = 0100 ?
13213  025370  001002                          BNE     E10344
13214  025372  102401                          BVS     E10344
13215  025374  103002                          BCC     A0344
13216
13217  025376  104005                  E10344: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
13218  025400  025356                          R0344                   ;ERROR LOOP RETURN
13219  025402  020412                  A0344:  CMP     R4,(R2)         ;RESULT OK ?
13220  025404  001403                          BEQ     O0344           ;BR IF YES
13221
13222  025406  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13223  025410  104000                  E20344: ERROR                   ;ROL DELIVERED THE WRONG RESULT
13224  025412  025356                          R0344                   ;ERROR LOOP RETURN
13225
13226  025414  000004                  O0344:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13227
```

```
13228                                   ; ***************************************************************************
13229                                          .SBTTL T0345 ADC DM1 TEST - <N:C> = 0101
13230                                   ; ***************************************************************************
13231
13232                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13233
13234                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13235
13236                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13237
13238                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 100000
13239
13240                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C =1010
13241
13242                                   ;SYNC:          B05J2 (-) T = 2 USEC
13243
13244                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=1L  /  K3-4 ADC L
13245
13246  025416  012700  000345           T0345:  MOV     #0345,R0                ;LOAD R0 WITH TEST NO.
13247  025422  013701  025446                   MOV     @#I0345,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13248  025426  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13249  025432  012704  100000                   MOV     #100000,R4      ;RESULT S / B = 100000
13250  025436  012712  077777           R0345:  MOV     #77777,(R2)     ;(DEST) = 77777
13251  025442  000257                           CCC                     ;CLEAR CODES
13252  025444  000265                           265                     ;N:C = 0101
13253
13254  025446  005512                   I0345:  ADC     (R2)            ;TEST THE ADC
13255
13256  025450  100003                           BPL     E10345          ;N:C = 1010 ?
13257  025452  001402                           BEQ     E10345
13258  025454  102001                           BVC     E10345
13259  025456  103002                           BCC     A0345
13260
13261  025460  104005                   E10345: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
13262  025462  025436                           R0345                   ;ERROR LOOP RETURN
13263  025464  020412                   A0345:  CMP     R4,(R2)         ;RESULT OK ?
13264  025466  001403                           BEQ     00345           ;BR IF YES
13265
13266  025470  011203                           MOV     (R2),R3         ;GET THE WAS DATA
13267  025472  104000                   E20345: ERROR                   ;ADC DELIVERED THE WRONG RESULT
13268  025474  025436                           R0345                   ;ERROR LOOP RETURN
13269
13270  025476  000004                   00345:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13271
```

```
13272                                   ; ***************************************************************************
13273                                          .SBTTL T0346 ADC DM1 TEST - <N:C> = 1011
13274                                   ; ***************************************************************************
13275
13276                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
13277
13278                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13279
13280                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,220  /  16[367]016,016
13281
13282                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000
13283
13284                                   ;CODES:         [211] SPS=1, [367] SPS=3   /   N:C = 0101
13285
13286                                   ;SYNC:          B05J2 (-) T = 2 USEC
13287
13288                                   ;KEY SIG:       K3-8 CINOO L   /   K3-3 DM=1L   /   K3-4 ADC L
13289
13290  025500  012700  000346           T0346:  MOV     #0346,R0                ;LOAD R0 WITH TEST NO.
13291  025504  013701  025526                   MOV     @#I0346,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13292  025510  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13293  025514  005004                           CLR     R4              ;RESULT S   /   B = 000000
13294  025516  012712  177777           R0346:  MOV     #-1,(R2)        ;[DEST] = 177777
13295  025522  000257                           CCC                     ;CLEAR CODES
13296  025524  000273                           273                     ;N:C = 1011
13297
13298  025526  005512                   I0346:  ADC     (R2)            ;TEST THE ADC
13299
13300  025530  100403                           BMI     E10346          ;N:C = 0101 ?
13301  025532  001002                           BNE     E10346
13302  025534  102401                           BVS     E10346
13303  025536  103402                           BCS     A0346
13304
13305  025540  104005                   E10346: ERRORS                  ;ADC FAILED TO ALTER THE CODES PROPERLY
13306  025542  025516                           R0346                   ;ERROR LOOP RETURN
13307  025544  020412                   A0346:  CMP     R4,(R2)         ;RESULT OK ?
13308  025546  001403                           BEQ     00346           ;BR IF YES
13309
13310  025550  011203                           MOV     (R2),R3         ;GET THE WAS DATA
13311  025552  104000                   E20346: ERROR                   ;ADC DELIVERED THE WRONG RESULT
13312  025554  025516                           R0346                   ;ERROR LOOP RETURN
13313
13314  025556  000004                   00346:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
13315                                   ; ***************************************************************************
13316                                   .SBTTL T0347 ADC DM1 TEST - <N:C> = 1010
13317                                   ; ***************************************************************************
13318
13319                                   ;MICROPROGRAMMING   /   LOGIC INFORMATION
13320
13321                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13322
13323                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,220  /  16[367]016,016
13324
13325                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 177777
13326
13327                                   ;CODES:         [211] SPS=1, [367] SPS=3   /   N:C = 1000
13328
13329                                   ;SYNC:          B05J2 (-) T = 2 USEC
13330
13331                                   ;KEY SIG:          /   K3-3 DM=1L   /   K3-4 ADC L
13332
13333  025560  012700  000347          T0347:  MOV     #0347,R0                ;LOAD R0 WITH TEST NO.
13334  025564  013701  025610                  MOV     @#I0347,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13335  025570  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13336  025574  012704  177777                  MOV     #-1,R4          ;RESULT S  /  B = 177777
13337  025600  012712  177777          R0347:  MOV     #-1,(R2)        ;[DEST] = 177777
13338  025604  000257                          CCC                     ;CLEAR CODES
13339  025606  000272                          272                     ;N:C = 1010
13340
13341  025610  005512                  I0347:  ADC     (R2)            ;TEST THE ADC
13342
13343  025612  100003                          BPL     E10347          ;N:C = 1000 ?
13344  025614  001402                          BEQ     E10347
13345  025616  102401                          BVS     E10347
13346  025620  103002                          BCC     A0347
13347
13348  025622  104005                  E10347: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
13349  025624  025600                          R0347                   ;ERROR LOOP RETURN
13350  025626  020412                  A0347:  CMP     R4,(R2)         ;RESULT OK ?
13351  025630  001403                          BEQ     00347           ;BR IF YES
13352
13353  025632  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13354  025634  104000                  E20347: ERROR                   ;ADC DELIVERED THE WRONG RESULT
13355  025636  025600                          R0347                   ;ERROR LOOP RETURN
13356
13357  025640  000004                  00347:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13358
```

```
13359                                   ; ***************************************************************************
13360                                   .SBTTL T0350 SBC DM1 TEST - <N:C> = 1011
13361                                   ; ***************************************************************************
13362
13363                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13364
13365                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13366
13367                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13368
13369                                   ;EXEC:          [220]ALUC=LHHHH :[211] D = 000000
13370
13371                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
13372
13373                                   ;SYNC:          B05J2 (-) T = 2 USEC
13374
13375                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L
13376
13377  025642  012700  000350          T0350:  MOV     #0350,R0                ;LOAD R0 WITH TEST NO.
13378  025646  013701  025670                  MOV     @#I0350,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13379  025652  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13380  025656  005004                          CLR     R4              ;RESULT S / B = 000000
13381  025660  012712  000001          R0350:  MOV     #1,(R2)         ;[DEST0351
13382  025664  000257                          CCC                     ;CLEAR CODES
13383  025666  000273                          273                     ;N:C = 1011
13384
13385  025670  005612                  I0350:  SBC     (R2)            ;TEST THE SBC
13386
13387  025672  100403                          BMI     E10350          ;N:C = 0100 ?
13388  025674  001002                          BNE     E10350
13389  025676  102401                          BVS     E10350
13390  025700  103002                          BCC     A0350
13391
13392  025702  104005                  E10350: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
13393  025704  025660                          R0350                   ;ERROR LOOP RETURN
13394  025706  020412                  A0350:  CMP     R4,(R2)         ;RESULT OK ?
13395  025710  001403                          BEQ     00350           ;BR IF YES
13396
13397  025712  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13398  025714  104000                  E20350: ERROR                   ;SBC DELIVERED THE WRONG RESULT
13399  025716  025660                          R0350                   ;ERROR LOOP RETURN
13400
13401  025720  000004                  00350:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13402
```

```
13403                                   ; ***************************************************************************
13404                                          .SBTTL T0351 SBC DM1 TEST - <N:C> = 0101
13405                                   ; ***************************************************************************
13406
13407                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13408
13409                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13410
13411                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13412
13413                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 077777
13414
13415                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0010
13416
13417                                   ;SYNC:          B05J2 (-) T = 2 USEC
13418
13419                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L
13420
13421  025722  012700  000351          T0351:  MOV     #0351,R0                ;LOAD R0 WITH TEST NO.
13422  025726  013701  025752                  MOV     @#I0351,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13423  025732  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13424  025736  012704  077777                  MOV     #077777,R4      ;RESULT S / B = 077777
13425  025742  012712  100000          R0351:  MOV     #100000,(R2)    ;[DEST] = 100000
13426  025746  000257                          CCC                     ;CLEAR CODES
13427  025750  000265                          265                     ;N:C = 0101
13428
13429  025752  005612                  I0351:  SBC     (R2)            ;TEST THE SBC
13430
13431  025754  100403                          BMI     E10351          ;N:C = 0010 ?
13432  025756  001402                          BEQ     E10351
13433  025760  102001                          BVC     E10351
13434  025762  103002                          BCC     A0351
13435
13436  025764  104005                  E10351: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
13437  025766  025742                          R0351                   ;ERROR LOOP RETURN
13438  025770  020412                  A0351:  CMP     R4,(R2)         ;RESULT OK ?
13439  025772  001403                          BEQ     00351           ;BR IF YES
13440
13441  025774  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13442  025776  104000                  E20351: ERROR                   ;SBC DELIVERED THE WRONG RESULT
13443  026000  025742                          R0351                   ;ERROR LOOP RETURN
13444
13445  026002  000004                  00351:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13446
```

```
13447                                   ; ***************************************************************************
13448                                          .SBTTL T0352 SBC DM1 TEST - <N:C> = 1110
13449                                   ; ***************************************************************************
13450
13451                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13452
13453                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13454
13455                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13456
13457                                   ;EXEC:          [220]ALUC=LLLLL :[211] D = 000001
13458
13459                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C 0001
13460
13461                                   ;SYNC:          B05J2 (-) T = 0001
13462
13463                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L
13464
13465  026004  012700  000352          T0352:  MOV     #0352,R0                ;LOAD R0 WITH TEST NO.
13466  026010  013701  026034                  MOV     @#I0352,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13467  026014  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13468  026020  012704  000001                  MOV     #1,R4           ;RESULT S / B = 1
13469  026024  012712  000001          R0352:  MOV     #1,(R2)         ;[DEST] = 1
13470  026030  000257                          CCC                     ;CLEAR CODES
13471  026032  000276                          276                     ;N:C = 1110
13472
13473  026034  005612                  I0352:  SBC     (R2)            ;TEST THE SBC
13474
13475  026036  100403                          BMI     E10352          ;N:C = 0000 ?
13476  026040  001402                          BEQ     E10352
13477  026042  102401                          BVS     E10352
13478  026044  103002                          BCC     A0352
13479
13480  026046  104005                  E10352: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
13481  026050  026024                          R0352                   ;ERROR LOOP RETURN
13482  026052  020412                  A0352:  CMP     R4,(R2)         ;RESULT OK ?
13483  026054  001403                          BEQ     00352           ;BR IF YES
13484
13485  026056  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13486  026060  104000                  E20352: ERROR                   ;SBC DELIVERED THE WRONG RESULT
13487  026062  026024                          R0352                   ;ERROR LOOP RETURN
13488
13489  026064  000004                  00352:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
13490                                   ; ***************************************************************************
13491                                           .SBTTL T0353 SBC DM1 TEST - <N:C> = 0111
13492                                   ; ***************************************************************************
13493
13494                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13495
13496                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13497
13498                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13499
13500                                   ;EXEC:          [220]ALUC=LHHLL :[211] D = 177777
13501
13502                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1001
13503
13504                                   ;SYNC:          B05J2 (-) T = 2 USEC
13505
13506                                   ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L
13507
13508  026066  012700  000353          T0353:  MOV     #0353,R0                ;LOAD R0 WITH TEST NO.
13509  026072  013701  026114                  MOV     @#I0353,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13510  026076  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13511  026102  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
13512  026106  005012                  R0353:  CLR     (R2)            ;[DEST] = 000000
13513  026110  000257                          CCC                     ;CLEAR CODES
13514  026112  000267                          267                     ;N:C = 0111
13515
13516  026114  005612                  I0353:  SBC     (R2)            ;TEST THE SBC
13517
13518  026116  100003                          BPL     E10353          ;N:C = 1001 ?
13519  026120  001402                          BEQ     E10353
13520  026122  102401                          BVS     E10353
13521  026124  103402                          BCS     A0353
13522
13523  026126  104005                  E10353: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
13524  026130  026106                          R0353                   ;ERROR LOOP RETURN
13525  026132  020412                  A0353:  CMP     R4,(R2)         ;RESULT OK ?
13526  026134  001403                          BEQ     00353           ;BR IF YES
13527
13528  026136  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13529  026140  104000                  E20353: ERROR                   ;SBC DELIVERED THE WRONG RESULT
13530  026142  026106                          R0353                   ;ERROR LOOP RETURN
13531
13532  026144  000004                  00353:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13533
```

```
13534                                   ; ***************************************************************
13535                                          .SBTTL T0354 NEGB - MODE 0 TEST - <N:C> = 0110
13536                                   ; ***************************************************************
13537
13538                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13539
13540                                   ;ROM SEQ:       [105,372,361,001] FC 1,7,8
13541
13542                                   ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001
13543
13544                                   ;EXEC:          [372]ALUC=LLHHL :[361]D= 000376
13545
13546                                   ;CODES:         [361]SPS=3       /      N:C=1001
13547
13548                                   ;SYNC:          B05J2   (-)      T= 1 USEC
13549
13550                                   ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
13551                                                   ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H
13552
13553  026146  012700  000354          T0354:  MOV     #0354,R0                ;LOAD R0 WITH TEST NO.
13554  026152  013701  026176                  MOV     @#I0354,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13555  026156  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
13556  026162  012704  177776                  MOV     #177776,R4      ;RESULT S / B = 376 (LO BYTE)
13557  026166  012703  177402          R0354:  MOV     #177402,R3      ;[DEST] = 177402
13558  026172  000257                          CCC                     ;CLEAR FLAGS
13559  026174  000266                          266                     ;N:C = 0110
13560
13561  026176  105403                  I0354:  NEGB    R3              ;TEST THE NEGB
13562
13563  026200  100003                          BPL     E10354          ;N:C = 1001
13564  026202  001402                          BEQ     E10354
13565  026204  102401                          BVS     E10354
13566  026206  103402                          BCS     A0354
13567
13568  026210  104000                  E10354: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
13569  026212  026166                          R0354                   ;ERROR LOOP RETURN ADDRESS
13570
13571  026214  020403                  A0354:  CMP     R4,R3           ;CORRECT RESULT ?
13572  026216  001402                          BEQ     00354           ;BR IF YES
13573
13574  026220  104000                  E20354: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
13575  026222  026166                          R0354                   ;ERROR LOOP RETURN ADDRESS
13576
13577  026224  000004                  00354:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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13578                                   ; ***************************************************************
13579                                           .SBTTL T0355 NEGB - MODE 0 TEST - <N:C> = 0011
13580                                   ; ***************************************************************
13581
13582                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13583
13584                                   ;ROM SEQ:       [105,372,361,001] FC 1,7,8
13585
13586                                   ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001
13587
13588                                   ;EXEC:          [372]ALUC=LLHHL :[361]D=000400
13589
13590                                   ;CODES:         [361]SPS=3       /      N:C=0100
13591
13592                                   ;SYNC:          B05J2   (-)     T= 1 USEC
13593
13594                                   ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
13595                                                   ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H
13596
13597  026226  012700  000355          T0355:  MOV     #0355,R0                ;LOAD R0 WITH TEST NO.
13598  026232  013701  026256                  MOV     @#I0355,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13599  026236  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
13600  026242  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
13601  026246  012703  177400          R0355:  MOV     #177400,R3      ;[DEST] = 177400
13602  026252  000257                          CCC                     ;CLEAR FLAGS
13603  026254  000263                          263                     ;N:C = 0011
13604
13605  026256  105403                  I0355:  NEGB    R3              ;TEST THE NEGB
13606
13607  026260  100403                          BMI     E10355          ;N:C = 0100
13608  026262  001002                          BNE     E10355
13609  026264  102401                          BVS     E10355
13610  026266  103002                          BCC     A0355
13611
13612  026270  104000                  E10355: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
13613  026272  026246                          R0355                   ;ERROR LOOP RETURN ADDRESS
13614
13615  026274  020403                  A0355:  CMP     R4,R3           ;CORRECT RESULT ?
13616  026276  001402                          BEQ     00355           ;BR IF YES
13617
13618  026300  104000                  E20355: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
13619  026302  026246                          R0355                   ;ERROR LOOP RETURN ADDRESS
13620
13621  026304  000004                  00355:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
13622
```

```
13623                                   ; ***************************************************************************
13624                                          .SBTTL T0356 NEGB - MODE 0 TEST - <N:C> = 1101
13625                                   ; ***************************************************************************
13626
13627                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13628
13629                                   ;ROM SEQ:       [105,372,361,001] FC 1,7,8
13630
13631                                   ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001
13632
13633                                   ;EXEC:          [372]ALUC=LLHHL :[361]D=000200
13634
13635                                   ;CODES:         [361]SPS=3       /      N:C=1011
13636
13637                                   ;SYNC:          B05J2   (-)      T= 1 USEC
13638
13639                                   ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
13640                                                   ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H
13641
13642  026306  012700  000356          T0356:  MOV     #0356,R0                ;LOAD R0 WITH TEST NO.
13643  026312  013701  026336                  MOV     @#I0356,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13644  026316  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
13645  026322  012704  177600                  MOV     #177600,R4      ;RESULT S / B = 200 (LO BYTE)
13646  026326  012703  177600          R0356:  MOV     #177600,R3      ;[DEST] = 177600
13647  026332  000257                          CCC                     ;CLEAR FLAGS
13648  026334  000275                          275                     ;N:C = 1101
13649
13650  026336  105403                  I0356:  NEGB    R3              ;TEST THE NEGB
13651
13652  026340  100003                          BPL     E10356          ;N:C = 1011
13653  026342  001402                          BEQ     E10356
13654  026344  102001                          BVC     E10356
13655  026346  103402                          BCS     A0356
13656
13657  026350  104000                  E10356: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
13658  026352  026326                          R0356                   ;ERROR LOOP RETURN ADDRESS
13659
13660  026354  020403                  A0356:  CMP     R4,R3           ;CORRECT RESULT ?
13661  026356  001402                          BEQ     00356           ;BR IF YES
13662
13663  026360  104000                  E20356: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
13664  026362  026326                          R0356                   ;ERROR LOOP RETURN ADDRESS
13665
13666  026364  000004                  00356:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
13667
```

```
13668                                   ; ***************************************************************
13669                                          .SBTTL T0357 CLRB - MODE 0 TEST - ‹N:C› = 1011
13670                                   ; ***************************************************************
13671
13672                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13673
13674                                   ;ROM SEQ:       [104,373,361,001] FC 1,7,8
13675
13676                                   ;ACT BUTS:      37[004]100,104  /  31[105]360,361  /  27[372]000,001
13677
13678                                   ;EXEC:          [104]ALUC=HLLHH :[373]D=000000
13679
13680                                   ;CODES:         [373]SPS=1,[361]SPS=3    /      N:C=0100
13681
13682                                   ;SYNC:          BO5J2   (-)     T= 1 USEC
13683
13684                                   ;KEY SIG:       K3-4 CLR L  /  K3-6 BYTE INSTR H  /  K3-4 OVLAP INSTR H  /  K3-3 DM=0 L
13685
13686  026366  012700  000357          T0357:  MOV     #0357,R0                ;LOAD R0 WITH TEST NO.
13687  026372  013701  026416                  MOV     @#I0357,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13688  026376  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
13689  026402  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
13690  026406  012703  177777          R0357:  MOV     #-1,R3          ;[DEST] = 177777
13691  026412  000257                          CCC                     ;CLEAR FLAGS
13692  026414  000273                          273                     ;N:C = 1011
13693
13694  026416  105003                  I0357:  CLRB    R3              ;TEST THE CLRB
13695
13696  026420  100403                          BMI     E10357          ;N:C = 0100 ?
13697  026422  001002                          BNE     E10357
13698  026424  102401                          BVS     E10357
13699  026426  103002                          BCC     A0357
13700
13701  026430  104000                  E10357: ERROR                   ;CLRB FAILED TO SET CODES PROPERLY
13702  026432  026406                          R0357                   ;ERROR LOOP RETURN ADDRESS
13703
13704  026434  020403                  A0357:  CMP     R4,R3           ;RESULT CORRECT ?
13705  026436  001402                          BEQ     00357           ;BR IF YES
13706
13707  026440  104000                  E20357: ERROR                   ;CLRB DELIVERED THE WRONG RESULT
13708  026442  026406                          R0357                   ;ERROR LOOP RETURN ADDRESS
13709
13710  026444  000004                  00357:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
13711                                   ; ***************************************************************************
13712                                   ;       .SBTTL T0360 CLRB - MODE 0 TEST - <N:C> = 0100
13713                                   ; ***************************************************************************
13714
13715                                   :MICROPROGRAMMING  /  LOGIC INFORMATION
13716
13717                                   ;RCM SEQ:       [104,373,361,001] FC 1,7,8
13718
13719                                   ;ACT BUTS:      37[004]100,104  /  31[360,361  /  27[373]000,001
13720
13721                                   ;EXEC:          [104]ALUC=HLLHH :[373]D=000000
13722
13723                                   ;CODES:         [373]SPS=1,[361]SPS=3    /      N:C=0100
13724
13725                                   ;SYNC:          BOSJ2   (-)     T= 1 USEC
13726
13727                                   ;KEY SIG:       K3-4 CLR L  /  K3-4 OVLAP INSTR H  /  K3-6 BYTE INSTR H  /  K3-8 CINOO L
13728                                   ;  K3-3 DM=0 L
13729
13730  026446  012700  000360           T0360:  MOV     #0360,R0                ;LOAD R0 WITH TEST NO.
13731  026452  013701  026476                   MOV     @#I0360,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13732  026456  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
13733  026462  012704  177400                   MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
13734  026466  012703  177777           R0360:  MOV     #-1,R3          ;[DEST] = 177777
13735  026472  000257                           CCC                     ;CLEAR FLAGS
13736  026474  000264                           SEZ                     ;N:C = 0100
13737
13738  026476  105003           I0360:  CLRB    R3                      ;TEST THE CLRB
13739
13740  026500  100403                   BMI     E10360          ;N:C = 0100 ?
13741  026502  001002                   BNE     E10360
13742  026504  102401                   BVS     E10360
13743  026506  103002                   BCC     A0360
13744
13745  026510  104000           E10360: ERROR                   ;CLRB FAILED TO SET CODES PROPERLY
13746  026512  026466                   R0360                   ;ERROR LOOP RETURN ADDRESS
13747
13748  026514  020403           A0360:  CMP     R4,R3           ;RESULT CORRECT ?
13749  026516  001402                   BEQ     00360           ;BR IF YES
13750
13751  026520  104000           E20360: ERROR                   ;CLRB DELIVERED THE WRONG RESULT
13752  026522  026466                   R0360                   ;ERROR LOOP RETURN ADDRESS
13753
13754  026524  000004           00360:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
13755
```

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13756                                   ; ***************************************************************************
13757                                          .SBTTL T0361 CLRB TEST - DM2 - ODD ADDRESS
13758                                   ; ***************************************************************************
13759
13760                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13761
13762                                   ;ROM SEQ:       [162,260,267,237,270,222,253,075,374,375,016] FC 1,3,9,8
13763
13764                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,222 / 16[374]016,016
13765
13766                                   ;EXEC:          [222]ALUC=HLLHH :[375] D = 000000
13767
13768                                   ;CODES:         [253] SP=1, [075] SP=3  /  N:C = 0100
13769
13770                                   ;SYNC:          BOSJ2 (-) T = 1.9 USEC
13771
13772                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BADD(1) H  /  K3-7 ODD BYTE H  /  K3-3 DM=2L
13773
13774  026526  012700  000361          T0361:  MOV     #0361,R0                ;LOAD R0 WITH TEST NO.
13775  026532  013701  026562                  MOV     @#I0361,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13776  026536  012702  067603                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
13777  026542  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
13778  026546  012705  067602                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
13779  026552  010203          R0361:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13780  026554  012715  177777                  MOV     #-1,(R5)        ;[DEST] = 177777
13781  026560  000257                          CCC                     ;SCOPE SYNC
13782
13783  026562  105023          I0361:  CLRB    (R3)+           ;TEST THE CLRB
13784
13785  026564  022703  067604                  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
13786  026570  001402                          BEQ     A0361           ;BR IF YES
13787
13788  026572  104005          E10361: ERROR5                  ;CLRB FAILED TO UPDATE DEST REG
13789  026574  026552                  R0361                   ;ERROR LOOP RETURN ADDRESS
13790
13791  026576  020415          A0361:  CMP     R4,(R5)         ;CORRECT RESULT ?
13792  026600  001403                          BEQ     00361           ;BR IF YES
13793
13794  026602  011503                          MOV     (R5),R3         ;GET THE WAS DATA
13795  026604  104000          E20361: ERROR                   ;CLRB DELIVERED WRONG RESULT
13796  026606  026552                  R0361                   ;ERROR LOOP RETURN ADDRESS
13797
13798  026610  000004          00361:  SCOPE                   ;CALL SCOPE LOOP UTILITY
13799
```

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13800                                   ; ***************************************************************************
13801                                           .SBTTL T0362 CLRB TEST - DM1 - ODD ADDRESS
13802                                   ; ***************************************************************************
13803
13804                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13805
13806                                   ;ROM SEQ:       [161,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8
13807
13808                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016
13809
13810                                   ;EXEC:          [222]ALUC=HLLHH :[375] D = 000000
13811
13812                                   ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0100
13813
13814                                   ;SYNC:          B05J2 (-) T = 1.9 USEC
13815
13816                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00 (1) H  /  K3-7 ODD BYTE H  /  K3-3 DM=2L
13817
13818  026612  012700  000362           T0362:  MOV     #0362,R0                ;LOAD R0 WITH TEST NO.
13819  026616  013701  026646                   MOV     @#I0362,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13820  026622  012702  067603                   MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
13821  026626  012704  000377                   MOV     #377,R4         ;RESULT S / B = 377
13822  026632  012705  067602                   MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
13823  026636  010203                   R0362:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13824  026640  012715  177777                   MOV     #-1,(R5)        ;[DEST] = 177777
13825  026644  000257                           CCC                     ;SCOPE SYNC
13826
13827  026646  105013                   I0362:  CLRB    (R3)            ;TEST THE CLRB
13828
13829  026650  020415                           CMP     R4,(R5)         ;CORRECT RESULT ?
13830  026652  001403                           BEQ     00362           ;BR IF YES
13831
13832  026654  011503                           MOV     (R5),R3         ;GET THE WAS DATA
13833  026656  104000                   E0362:  ERROR                   ;CLRB DELIVERED WRONG RESULT
13834  026660  026636                           R0362                   ;ERROR LOOP RETURN ADDRESS
13835
13836  026662  000004                   00362:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
13837                                   ; ***************************************************************************
13838                                           .SBTTL T0363 CLRB TEST - DM2 - EVEN ADDRESS
13839                                   ; ***************************************************************************
13840
13841                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13842
13843                                   ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8
13844
13845                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016
13846
13847                                   ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000
13848
13849                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
13850
13851                                   ;SYNC:          BOSJ2 (-) T = 1.9 USEC
13852
13853                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 DM=1L  /  K3-4 CLR L
13854
13855  026664  012700  000363          T0363:  MOV     #0363,R0                ;LOAD R0 WITH TEST NO.
13856  026670  013701  026714                  MOV     @#I0363,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13857  026674  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13858  026700  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
13859  026704  010203                  R0363:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13860  026706  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
13861  026712  000257                          CCC                     ;SCOPE SYNC
13862
13863  026714  105023                  I0363:  CLRB    (R3)+           ;TEST THE CLRB
13864
13865  026716  022703  067603                  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
13866  026722  001402                          BEQ     A0363           ;BR IF YES
13867
13868  026724  104005                  E10363: ERROR5                  ;CLRB FAILED TO UPDATE DEST REG
13869  026726  026704                          R0363                   ;ERROR LOOP RETURN ADDRESS
13870
13871  026730  020412                  A0363:  CMP     R4,(R2)         ;CORRECT RESULT ?
13872  026732  001403                          BEQ     00363           ;BR IF YES
13873
13874  026734  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13875  026736  104000                  E20363: ERROR                   ;CLRB DELIVERED WRONG RESULT
13876  026740  026704                          R0363                   ;ERROR LOOP RETURN ADDRESS
13877
13878  026742  000004                  00363:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
13879                                   ; ***************************************************************************
13880                                           .SBTTL T0364 CLRB TEST - DM1 - EVEN ADDRESS
13881                                   ; ***************************************************************************
13882
13883                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13884
13885                                   ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8
13886
13887                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016
13888
13889                                   ;EXEC:          [220]ALUC=HLLHH :[367] D = 000000
13890
13891                                   ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100
13892
13893                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
13894
13895                                   ;KEY SIG:       K3-6 BYTE INSTR H
13896
13897  026744  012700  000364          T0364:  MOV     #0364,R0            ;LOAD R0 WITH TEST NO.
13898  026750  013701  026774                  MOV     @#I0364,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13899  026754  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
13900  026760  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
13901  026764  010203                  R0364:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13902  026766  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
13903  026772  000257                          CCC                     ;SCOPE SYNC
13904
13905  026774  105013                  I0364:  CLRB    (R3)            ;TEST THE CLRB
13906
13907  026776  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
13908  027000  001403                          BEQ     00364           ;BR IF YES
13909
13910  027002  011203                          MOV     (R2),R3         ;GET THE WAS DATA
13911  027004  104000                  E0364:  ERROR                   ;CLRB DELIVERED WRONG RESULT
13912  027006  026764                          R0364                   ;ERROR LOOP RETURN ADDRESS
13913
13914  027010  000004                  00364:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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13915                                   ; ***************************************************************************
13916                                          .SBTTL T0365 NEGB TEST - DM2 - ODD ADDRESS
13917                                   ; ***************************************************************************
13918
13919                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13920
13921                                   ;ROM SEQ:       [162,260,267,237,270,223,253,075,374,375,016] FC 1,3,9,8
13922
13923                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,223 / 16[374]016,016
13924
13925                                   ;EXEC:          [223]ALUC=LLHHL :[375] D = 000400
13926
13927                                   ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0001
13928
13929                                   ;SYNC:          B05J2 (-) T = 1.9 USEC
13930
13931                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K3-9 CIN00
13932
13933  027012  012700  000365          T0365:  MOV     #0365,R0                ;LOAD R0 WITH TEST NO.
13934  027016  013701  027046                  MOV     @#I0365,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13935  027022  012702  067603                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
13936  027026  012704  000777                  MOV     #777,R4         ;RESULT S / B = 777
13937  027032  012705  067602                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
13938  027036  010203          R0365:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13939  027040  012715  177777                  MOV     #-1,(R5)        ;[DEST] = 177777
13940  027044  000257                          CCC                     ;SCOPE SYNC
13941
13942  027046  105423          I0365:  NEGB    (R3)+           ;TEST THE NEGB
13943
13944  027050  022703  067604                  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
13945  027054  001402                          BEQ     A0365           ;BR IF YES
13946
13947  027056  104005          E10365: ERROR5                  ;NEGB FAILED TO UPDATE DEST REG
13948  027060  027036                  R0365                   ;ERROR LOOP RETURN ADDRESS
13949
13950  027062  020415          A0365:  CMP     R4,(R5)         ;CORRECT RESULT ?
13951  027064  001403                  BEQ     00365           ;BR IF YES
13952
13953  027066  011503                  MOV     (R5),R3         ;GET THE WAS DATA
13954  027070  104000          E20365: ERROR                   ;NEGB DELIVERED WRONG RESULT
13955  027072  027036                  R0365                   ;ERROR LOOP RETURN ADDRESS
13956
13957  027074  000004          00365:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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13958                                   ; ***************************************************************************
13959                                           .SBTTL T0366 NEGB TEST - DM1 - ODD ADDRESS
13960                                   ; ***************************************************************************
13961
13962                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
13963
13964                                   ;ROM SEQ:       [161,266,267,237,270,223,253,075,374,375,016] FC 1,3,9,8
13965
13966                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,223 / 16[374]016,016
13967
13968                                   ;EXEC:          [223]ALUC=LLHHL :[375] D = 000400
13969
13970                                   ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0001
13971
13972                                   ;SYNC:          B05J2 (-) T = 1.9 USEC
13973
13974                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00 (1) H  /  K3-7 ODD BYTE H  /  K3-8 CIN00
13975
13976  027076  012700  000366           T0366:  MOV     #0366,R0                ;LOAD R0 WITH TEST NO.
13977  027102  013701  027132                   MOV     @#I0366,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
13978  027106  012702  067603                   MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
13979  027112  012704  000777                   MOV     #777,R4         ;RESULT S / B = 777
13980  027116  012705  067602                   MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
13981  027122  010203                   R0366:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
13982  027124  012715  177777                   MOV     #-1,(R5)        ;[DEST] = 177777
13983  027130  000257                           CCC                     ;SCOPE SYNC
13984
13985  027132  105413                   I0366:  NEGB    (R3)            ;TEST THE NEGB
13986
13987  027134  020415                           CMP     R4,(R5)         ;CORRECT RESULT ?
13988  027136  001403                           BEQ     00366           ;BR IF YES
13989
13990  027140  011503                           MOV     (R5),R3         ;GET THE WAS DATA
13991  027142  104000                   E0366:  ERROR                   ;NEGB DELIVERED WRONG RESULT
13992  027144  027122                           R0366                   ;ERROR LOOP RETURN ADDRESS
13993
13994  027146  000004                   00366:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
13995                                   ; ***************************************************************************
13996                                           .SBTTL T0367 NEGB TEST - DM2 - EVEN ADDRESS
13997                                   ; ***************************************************************************
13998
13999                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14000
14001                                   ;ROM SEQ:       [162,260,267,221,367,375,016] FC 1,3,9,8
14002
14003                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,221 / 16[367]016,016
14004
14005                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 000001
14006
14007                                   ;CODES:         [367] SPS=3  /  N:C = 0001
14008
14009                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
14010
14011                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-8 CIN00 L  /  K3-4 NEG L  /  K3-3 DM=2L
14012
14013  027150  012700  000367           T0367:  MOV     #0367,R0                ;LOAD R0 WITH TEST NO.
14014  027154  013701  027200                   MOV     @#I0367,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14015  027160  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14016  027164  012704  177401                   MOV     #177401,R4      ;RESULT S / B = 177401
14017  027170  010203                   R0367:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
14018  027172  012712  177777                   MOV     #-1,(R2)        ;[DEST] = 177777
14019  027176  000257                           CCC                     ;SCOPE SYNC
14020
14021  027200  105423                   I0367:  NEGB    (R3)+           ;TEST THE NEGB
14022
14023  027202  022703  067603                   CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
14024  027206  001402                           BEQ     A0367           ;BR IF YES
14025
14026  027210  104005                   E10367: ERROR5                  ;NEGB FAILED TO UPDATE DEST REG
14027  027212  027170                           R0367                   ;ERROR LOOP RETURN ADDRESS
14028
14029  027214  020412                   A0367:  CMP     R4,(R2)         ;CORRECT RESULT ?
14030  027216  001403                           BEQ     00367           ;BR IF YES
14031
14032  027220  011203                           MOV     (R2),R3         ;GET THE WAS DATA
14033  027222  104000                   E20367: ERROR                   ;NEGB DELIVERED WRONG RESULT
14034  027224  027170                           R0367                   ;ERROR LOOP RETURN ADDRESS
14035
14036  027226  000004                   00367:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
14037                                   ; ***************************************************************************
14038                                           .SBTTL T0370 NEGB TEST - DM1 - EVEN ADDRESS
14039                                   ; ***************************************************************************
14040
14041                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14042
14043                                   ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8
14044
14045                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016
14046
14047                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 000001
14048
14049                                   ;CODES:         [367] SPS=3  /  N:C = 0001
14050
14051                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
14052
14053                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-8 CINOO L  /  K3-4 NEG L  /  K3-3 DM=2L
14054
14055  027230  012700  000370          T0370:  MOV     #0370,R0                ;LOAD R0 WITH TEST NO.
14056  027234  013701  027260                  MOV     @#I0370,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14057  027240  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14058  027244  012704  177401                  MOV     #177401,R4      ;RESULT S / B = 177401
14059  027250  010203                  R0370:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
14060  027252  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
14061  027256  000257                          CCC                     ;SCOPE SYNC
14062
14063  027260  105413                  I0370:  NEGB    (R3)            ;TEST THE NEGB
14064
14065  027262  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
14066  027264  001403                          BEQ     00370           ;BR IF YES
14067
14068  027266  011203                          MOV     (R2),R3         ;GET THE WAS DATA
14069  027270  104000                  E0370:  ERROR                   ;NEGB DELIVERED WRONG RESULT
14070  027272  027250                          R0370                   ;ERROR LOOP RETURN ADDRESS
14071
14072  027274  000004                  00370:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
14073                                   ; ***************************************************************************
14074                                          .SBTTL T0371 ADD TEST - SM0,DM0 - <N:C> = 1010
14075                                   ; ***************************************************************************
14076
14077                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14078
14079                                   ;ROM SEQ:       [102,364,300,001] FC 1,7,8
14080
14081                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
14082
14083                                   ;EXEC:          [364]ALUC=LHLLH :[360] D = 000000
14084
14085                                   ;CODES:         [360] SPS=3  /  N:C = 0101
14086
14087                                   ;SYNC:          B05J2 (-) T = 1 USEC
14088
14089                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L
14090
14091  027276  012700  000371           T0371:  MOV     #0371,R0                ;LOAD R0 WITH TEST NO.
14092  027302  013701  027330                   MOV     @#I0371,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14093  027306  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
14094  027312  005004                           CLR     R4              ;RESULT S / B = 000000
14095  027314  012705  177777                   MOV     #-1,R5          ;SRC OPR = 177777
14096  027320  012703  000001           R0371:  MOV     #+1,R3          ;[DEST0372
14097  027324  000257                           CCC                     ;CLEAR FLAGS
14098  027326  000272                           272                     ;N:C = 1010
14099
14100  027330  060503           I0371:  ADD     R5,R3           ;TEST THE ADD
14101
14102  027332  100403                   BMI     E10371          ;N:C = 0101
14103  027334  001002                   BNE     E10371
14104  027336  102401                   BVS     E10371
14105  027340  103402                   BCS     A0371
14106
14107  027342  104005           E10371: ERROR5                  ;ADD FAILED TO ALTER CODES PROPERLY
14108  027344  027320                   R0371                   ;ERROR LOOP RETURN ADDRESS
14109
14110  027346  020403           A0371:  CMP     R4,R3           ;CORRECT RESULT ?
14111  027350  001402                   BEQ     00371           ;BR IF YES
14112
14113  027352  104000           E20371: ERROR                   ;ADD DELIVERED THE WRONG RESULT
14114  027354  027320                   R0371                   ;ERROR LOOP RETURN ADDRESS
14115
14116  027356  000004           00371:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
14117                                   ; ***************************************************************************
14118                                           .SBTTL T0372 ADD TEST - SM0,DM0 - <N:C> = 0101
14119                                   ; ***************************************************************************
14120
14121                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14122
14123                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
14124
14125                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
14126
14127                                   ;EXEC:          [364]ALUC=LHLLH :[360] D = 100006
14128
14129                                   ;CODES:         [360] SPS=3  /  N:C = 1010
14130
14131                                   ;SYNC:          B05J2 (-) T = 1 USEC
14132
14133                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L
14134
14135  027360  012700  000372          T0372:  MOV     #0372,R0                ;LOAD R0 WITH TEST NO.
14136  027364  013701  027414                  MOV     @#I0372,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14137  027370  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14138  027374  012704  100006                  MOV     #100006,R4      ;RESULT S / B = 100006
14139  027400  012705  077777                  MOV     #77777,R5       ;SRC OPR = 77777
14140  027404  012703  000007          R0372:  MOV     #7,R3           ;[DEST] = 7
14141  027410  000257                          CCC                     ;CLEAR FLAGS
14142  027412  000265                          265                     ;N:C = 0101
14143
14144  027414  060503                  I0372:  ADD     R5,R3           ;TEST THE ADD
14145
14146  027416  100003                          BPL     E10372          ;N:C = 1010
14147  027420  001402                          BEQ     E10372
14148  027422  102001                          BVC     E10372
14149  027424  103002                          BCC     A0372
14150
14151  027426  104005                  E10372: ERROR5                  ;ADD FAILED TO ALTER CODES PROPERLY
14152  027430  027404                          R0372                   ;ERROR LOOP RETURN ADDRESS
14153
14154  027432  020403                  A0372:  CMP     R4,R3           ;CORRECT RESULT ?
14155  027434  001402                          BEQ     00372           ;BR IF YES
14156
14157  027436  104000                  E20372: ERROR                   ;ADD DELIVERED THE WRONG RESULT
14158  027440  027404                          R0372                   ;ERROR LOOP RETURN ADDRESS
14159
14160  027442  000004                  00372:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
14161                                   ; ***************************************************************************
14162                                         .SBTTL T0373 ADD SM1,DM0 TEST
14163                                   ; ***************************************************************************
14164
14165                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14166
14167                                   ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8
14168
14169                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
14170
14171                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14172
14173                                   ;CODES:         [360] SPS=3
14174
14175                                   ;SYNC:          B05J2 (-) T = 2 USEC
14176
14177                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  / K3-3 SM=1L
14178
14179  027444  012700  000373          T0373:  MOV     #0373,R0                ;LOAD R0 WITH THE TEST NO.
14180  027450  013701  027474                  MOV     @#I0373,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14181  027454  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14182  027460  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14183  027464  012705  067566          R0373:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14184  027470  005003                          CLR     R3              ;[DEST] = 0
14185  027472  000257                          CCC                     ;SCOPE SYNC
14186
14187  027474  061503                  I0373:  ADD     (R5),R3         ;TEST THE ADD - SM1,DM0
14188
14189  027476  020403                          CMP     R4,R3           ;RESULT = #DWTA?
14190  027500  001402                          BEQ     A0373           ;BR IF YES
14191
14192  027502  104000                  E10373: ERROR                   ;ADD DELIVERED WRONG RESULT
14193  027504  027464                          R0373                   ;ERROR LOOP RETURN
14194
14195  027506  022705  067566          A0373:  CMP     #ATA,R5         ;DID ADD CHANGE REG.
14196  027512  001402                          BEQ     00373           ;BR IF NOT
14197
14198  027514  104005                  E20373: ERROR5                  ;REG GOT MODIFIED
14199  027516  027464                          R0373                   ;ERROR LOOP RETURN
14200
14201  027520  000004                  00373:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14202
```

```
14203                                   ; ***************************************************************************
14204                                           .SBTTL T0374 ADD SM2,DM0 TEST
14205                                   ; ***************************************************************************
14206
14207                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14208
14209                                   ;ROM SEQ:       [142,240,250,120,371,360,000] FC 1,2,8
14210
14211                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,360 / 27[371]000,000
14212
14213                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14214
14215                                   ;CODES:         [360] SPS=3
14216
14217                                   ;SYNC:          B05J2 (-) T = USEC
14218
14219                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=2L  /  K5-5 BCON (1+2) H
14220
14221  027522  012700  000374          T0374:  MOV     #0374,R0                ;LOAD R0 WITH THE TEST NO.
14222  027526  013701  027564                  MOV     @#I0374,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14223  027532  032737  000200  066642          BIT     #200,@#BPTLOC   ;BREAKPOINT HALT SET ??
14224  027540  001401                          BEQ     .+4             ;BR IF NOT
14225  027542  000000                          HALT                    ;BREAK- DEPRESS CONTINUE TO RESTART
14226  027544  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14227  027550  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14228  027554  012705  067566          R0374:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14229  027560  005003                          CLR     R3              ;[DEST] = 0
14230  027562  000257                          CCC                     ;SCOPE SYNC
14231
14232  027564  062503                  I0374:  ADD     (R5)+,R3        ;TEST THE ADD - SM2,DM0
14233
14234  027566  020403                          CMP     R4,R3           ;RESULT = #DWTA
14235  027570  001402                          BEQ     A0374           ;BR IF YES
14236
14237  027572  104000                  E10374: ERROR                   ;ADD DELIVERED WRONG RESULT
14238  027574  027554                          R0374                   ;ERROR LOOP RETURN
14239
14240  027576  022705  067570          A0374:  CMP     #ATA+2,R5       ;DID ADD AUTO INCREMENT SOURCE REG?
14241  027602  001402                          BEQ     00374           ;BR IF YES
14242
14243  027604  104005                  E20374: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG.
14244  027606  027554                          R0374                   ;ERROR LOOP RETURN
14245
14246  027610  000004                  00374:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14247
```

```
14248                                   ; ***************************************************************************
14249                                   .SBTTL T0375 ADD SM3,DMO TEST
14250                                   ; ***************************************************************************
14251
14252                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14253
14254                                   ;ROM SEQ:       [143,245,246,247,250,120,371,360,000] FC 1,2,8
14255
14256                                   ;ACT BUTS:      37[004]100,143 / 35[247]120,120 / 31[120]360,360 / 27[37]000,000
14257
14258                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14259
14260                                   ;CODES:         [360] SPS=3
14261
14262                                   ;SYNC:          B05J2 (-) T = 2.75 USEC
14263
14264                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=2L  /  K5-5 BC01 H
14265
14266  027612  012700  000375           T0375:  MOV     #0375,R0                ;LOAD R0 WITH THE TEST NO.
14267  027616  013701  027646                   MOV     @#I0375,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14268  027622  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
14269  027626  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14270  027632  012705  067576           R0375:  MOV     #ATA+10,R5      ;R5 POINTS TO SOURCE ADDR
14271  027636  010437  067602                   MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
14272  027642  005003                           CLR     R3              ;[DEST] = 0
14273  027644  000257                           CCC                     ;SCOPE SYNC
14274
14275  027646  063503           I0375:  ADD     @(R5)+,R3               ;TEST THE ADD - SM3,DMO
14276
14277  027650  020437  067602                   CMP     R4,@#MBUF0      ;RESULT = #DWTA?
14278  027654  001402                           BEQ     A0375           ;BR IF YES
14279
14280  027656  104000           E10375: ERROR                           ;ADD DELIVERED WRONG RESULT
14281  027660  027632                   R0375                           ;ERROR LOOP RETURN
14282
14283  027662  022705  067600           A0375:  CMP     #ATA+12,R5      ;DID ADD AUTO INCREMENT SOURCE REG?
14284  027666  001402                           BEQ     00375           ;BR IF YES
14285
14286  027670  104005           E20375: ERROR5                          ;ADD FAILED TO UPDATE SOURCE REG.
14287  027672  027632                   R0375                           ;ERROR LOOP RETURN
14288
14289  027674  000004           00375:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14290
```

```
14291                                   ; ***************************************************************************
14292                                           .SBTTL T0376 ADD SM4,DMO TEST
14293                                   ; ***************************************************************************
14294
14295                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14296
14297                                   ;ROM SEQ:       [144,240,250,120,371,360,000] FC 1,2,8
14298
14299                                   ;ACT BUTS:      37[004]100,144 / 35[240]120,120 / 31[120]360,360 / 27[371]000,000
14300
14301                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14302
14303                                   ;CODES:         [360] SPS=3
14304
14305                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
14306
14307                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=4L  /  K5-5 BCON (1+2) H
14308
14309  027676  012700  000376          T0376:  MOV     #0376,R0                ;LOAD R0 WITH THE TEST NO.
14310  027702  013701  027726                  MOV     @#I0376,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14311  027706  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14312  027712  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14313  027716  012705  067570          R0376:  MOV     #ATA+2,R5       ;SOURCE ADDR = ATA
14314  027722  005003                          CLR     R3              ;[DEST] = 0
14315  027724  000257                          CCC                     ;SCOPE SYNC
14316
14317  027726  064503                  I0376:  ADD     -(R5),R3        ;TEST THE ADD - SM4,DMO
14318
14319  027730  020403                          CMP     R4,R3           ;RESULT = #DWTA?
14320  027732  001402                          BEQ     A0376           ;BR IF YES
14321
14322  027734  104000                  E10376: ERROR                   ;ADD DELIVERED WRONG RESULT
14323  027736  027716                          R0376                   ;ERROR LOOP RETURN
14324
14325  027740  022705  067566          A0376:  CMP     #ATA,R5         ;DID SOURCE REG GET DECREMENTED?
14326  027744  001402                          BEQ     00376           ;BR IF YES
14327
14328  027746  104005                  E20376: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG
14329  027750  027716                          R0376                   ;ERROR LOOP RETURN
14330
14331  027752  000004                  00376:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14332
```

```
14333                                   ; ***************************************************************************
14334                                          .SBTTL T0377 ADD SM5,DM0 TEST
14335                                   ; ***************************************************************************
14336
14337                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14338
14339                                   ;ROM SEQ:       [145,245,246,247,250,120,371,360,000] FC 1,2,8
14340
14341                                   ;ACT BUTS:      37[004]100,145 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
14342
14343                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14344
14345                                   ;CODES:         [360] SPS=3
14346
14347                                   ;SYNC:          B05J2 (-) T = 2.75 USEC
14348
14349                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=5L  /  K5-5 BC01 H
14350
14351  027754  012700  000377          T0377:  MOV     #0377,R0                ;LOAD R0 WITH THE TEST NO.
14352  027760  013701  030010                  MOV     @#I0377,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14353  027764  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14354  027770  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14355  027774  012705  067600          R0377:  MOV     #ATA+12,R5      ;R5 POINTS TO SOURCE ADDR
14356  030000  010437  067602                  MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
14357  030004  005003                          CLR     R3              ;[DEST] = 0
14358  030006  000257                          CCC                     ;SCOPE SYNC
14359
14360  030010  065503          I0377:  ADD     @-(R5),R3       ;TEST THE ADD - SM5,DM0
14361
14362  030012  020437  067602                  CMP     R4,@#MBUF0      ;RESULT = #DWTA?
14363  030016  001402                          BEQ     A0377           ;BR IF YES
14364
14365  030020  104000          E10377: ERROR                   ;ADD DELIVERED WRONG RESULT
14366  030022  027774                  R0377                   ;ERROR LOOP RETURN
14367
14368  030024  022705  067576  A0377:  CMP     #ATA+10,R5      ;DID ADD DECREMENT SOURCE REG?
14369  030030  001402                          BEQ     00377           ;BR IF YES
14370
14371  030032  104005          E20377: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG.
14372  030034  027774                  R0377                   ;ERROR LOOP RETURN
14373
14374  030036  000004          00377:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14375
```

```
14376                                   ; ***************************************************************************
14377                                          .SBTTL T0400 ADD SM6,DMO TEST
14378                                   ; ***************************************************************************
14379
14380                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14381
14382                                   ;ROM SEQ:       [146,241,242,247,250,120,371,360,000] FC 1,2,8
14383
14384                                   ;ACT BUTS:      37[004]100,146 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
14385
14386                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #MBUF0
14387
14388                                   ;CODES:         [360] SPS=3
14389
14390                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
14391
14392                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=6L  /  K3-4 OVLAP CYCLE L
14393
14394  030040  012700  000400          T0400:  MOV     #0400,R0                ;LOAD R0 WITH THE TEST NO.
14395  030044  013701  030070                  MOV     @#I0400,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14396  030050  012703  177703                  MOV     #177703,R3      ;DEST ADDR = R3
14397  030054  012704  067602                  MOV     #MBUF0,R4       ;RESULT S / B = MBUF0
14398  030060  012705  067566          R0400:  MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
14399  030064  005003                          CLR     R3              ;[DEST] = 0
14400  030066  000257                          CCC                     ;SCOPE SYNC
14401
14402  030070  066503  000010          I0400:  ADD     10(R5),R3       ;TEST THE ADD - SM6,DMO
14403
14404  030074  020403                          CMP     R4,R3           ;RESULT =MBUF0?
14405  030076  001402                          BEQ     00400           ;BR IF YES
14406
14407  030100  104000          E0400:  ERROR                           ;ADD DELIVERED WRONG RESULT
14408  030102  030060                  R0400                           ;ERROR LOOP RETURN
14409
14410  030104  000004          00400:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14411
```

```
14412                                   ; ************************************************************************
14413                                           .SBTTL T0401 ADD SM7,DMO TEST
14414                                   ; ************************************************************************
14415
14416                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14417
14418                                   ;ROM SEQ:       [147,243,244,245,246,247,250,120,371,360,000] FC 1,2,8
14419
14420                                   ;ACT BUTS:      37[004]100,147 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
14421
14422                                   ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA
14423
14424                                   ;CODES:         [360] SPS=3
14425
14426                                   ;SYNC:          B05J2 (-) T = 3.5 USEC
14427
14428                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=7L  /  K3-4 OVLAP CYCLE L
14429
14430  030106  012700  000401          T0401:  MOV     #0401,R0                ;LOAD R0 WITH THE TEST NO.
14431  030112  013701  030142                  MOV     @#I0401,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14432  030116  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
14433  030122  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14434  030126  012705  067566          R0401:  MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
14435  030132  010437  067602                  MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
14436  030136  005003                          CLR     R3              ;[DEST] = 0
14437  030140  000257                          CCC                     ;SCOPE SYNC
14438
14439  030142  067503  000010          I0401:  ADD     @10(R5),R3      ;TEST THE ADD - SM7,DMO
14440
14441  030146  020403                          CMP     R4,R3           ;RESULT = #DWTA?
14442  030150  001402                          BEQ     00401           ;BR IF YES
14443
14444  030152  104000          E0401:  ERROR                           ;ADD DELIVERED WRONG RESULT
14445  030154  030126                  R0401                           ;ERROR LOOP RETURN
14446
14447  030156  000004          00401:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14448
```

```
14449                                   ; ***************************************************************************
14450                                           .SBTTL T0402 ADD SM1,DM1 TEST
14451                                   ; ***************************************************************************
14452
14453                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14454
14455                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
14456
14457                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,161 / 33[266]220,225 / 16[367]016,016
14458
14459                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14460
14461                                   ;CODES:         [367] SPS=3
14462
14463                                   ;SYNC:          B05J2 (-) T = 2.6 USEC
14464
14465                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=1L  /  K3-3 SM=1L
14466
14467  030160  012700  000402          T0402:  MOV     #0402,R0                ;LOAD R0 WITH THE TEST NO.
14468  030164  013701  030210                  MOV     @#I0402,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14469  030170  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14470  030174  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14471  030200  012705  067566          R0402:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14472  030204  005012                          CLR     (R2)            ;[DEST] = 0
14473  030206  000257                          CCC                     ;SCOPE SYNC
14474
14475  030210  061512                  I0402:  ADD     (R5),(R2)       ;TEST THE ADD - SM1,DM1
14476
14477  030212  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
14478  030214  001403                          BEQ     00402           ;BR IF YES
14479
14480  030216  011203                          MOV     (R2),R3         ;GET WAS DATA
14481  030220  104000                  E0402:  ERROR                   ;ADD DELIVERED WRONG RESULT
14482  030222  030200                          R0402                   ;ERROR LOOP RETURN
14483
14484  030224  000004                  00402:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14485
```

```
14486                                   ; ***************************************************************************
14487                                           .SBTTL T0403 ADD SM2,DM1 TEST
14488                                   ; ***************************************************************************
14489
14490                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14491
14492                                   ;ROM SEQ:       [142,240,250,161,266,267,225,367,375,016] FC 1,2,3,8
14493
14494                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,161 / 35[266]220,225 / 16[367]016,016
14495
14496                                   ;EXEC:          [225]ALUC=LLLLH :[367] D = #DWTA
14497
14498                                   ;CODES:         [367] SPS=3
14499
14500                                   ;SYNC:          B05J2  (-) T = 2.7 USEC
14501
14502                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=1L
14503
14504  030226  012700  000403           T0403:  MOV     #0403,R0                ;LOAD R0 WITH THE TEST NO.
14505  030232  013701  030256                   MOV     @#I0403,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14506  030236  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14507  030242  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14508  030246  012705  067566           R0403:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14509  030252  005012                           CLR     (R2)            ;[DEST] = 0
14510  030254  000257                           CCC                     ;SCOPE SYNC
14511
14512  030256  062512                   I0403:  ADD     (R5)+,(R2)      ;TEST THE ADD - SM2,DM1
14513
14514  030260  020412                           CMP     R4,(R2)         ;RESULT = #DWTA?
14515  030262  001403                           BEQ     00403           ;BR IF YES
14516
14517  030264  011203                           MOV     (R2),R3         ;GET WAS DATA
14518  030266  104000                   E0403:  ERROR                   ;ADD DELIVERED WRONG RESULT
14519  030270  030246                           R0403                   ;ERROR LOOP RETURN
14520
14521  030272  000004                   00403:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14522
```

```
14523                                   ; ***************************************************************************
14524                                           .SBTTL T0404 ADD SM1,DM2 TEST
14525                                   ; ***************************************************************************
14526
14527                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14528
14529                                   ;ROM SEQ:       [141,247,250,162,260,267,225,367,375,016] FC 1,2,3,8
14530
14531                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,162 / 33[260]220,225 / 16[367]016,016
14532
14533                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14534
14535                                   ;CODES:         [367] SPS=3
14536
14537                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
14538
14539                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=2L  /  K3-3 SM=1L
14540
14541  030274  012700  000404           T0404:  MOV     #0404,R0            ;LOAD R0 WITH THE TEST NO.
14542  030300  013701  030326                   MOV     @#I0404,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14543  030304  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14544  030310  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14545  030314  012705  067566           R0404:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14546  030320  010203                           MOV     R2,R3           ;[R3] = DEST ADDR
14547  030322  005012                           CLR     (R2)            ;[DEST] = 0
14548  030324  000257                           CCC                     ;SCOPE SYNC
14549
14550  030326  061523                   I0404:  ADD     (R5),(R3)+      ;TEST THE ADD - SM1,DM2
14551
14552  030330  020412                           CMP     R4,(R2)         ;RESULT = #DWTA?
14553  030332  001407                           BEQ     A0404           ;BR IF YES
14554
14555  030334  010337  067606                   MOV     R3,@#MBUF1      ;SAVE UPDATED DEST ADDR
14556  030340  011203                           MOV     (R2),R3         ;GET WAS DATA
14557  030342  104000                   E10404: ERROR                   ;ADD DELIVERED WRONG RESULT
14558  030344  030314                           R0404                   ;ERROR LOOP RETURN
14559
14560  030346  013703  067606                   MOV     @#MBUF1,R3      ;RESTORE UPDATED DEST ADDR
14561  030352  022703  067604           A0404:  CMP     #MBUF0+2,R3     ;DID ADD INCREMENT DEST REG
14562  030356  001402                           BEQ     00404           ;BR IF YES
14563
14564  030360  104005                   E20404: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
14565  030362  030314                           R0404                   ;ERROR LOOP RETURN
14566
14567  030364  000004                   00404:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14568
```

```
                                ; ***************************************************************************
                                        .SBTTL T0405 ADD SM2,DM2 TEST
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=2L

030366  012700  000405       T0405:  MOV     #0405,R0                ;LOAD R0 WITH THE TEST NO.
030372  013701  030420               MOV     @#I0405,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030376  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030402  012704  067612               MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030406  012705  067566       R0405:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030412  010203                       MOV     R2,R3           ;[R3] = DEST ADDR
030414  005012                       CLR     (R2)            ;[DEST] = 0
030416  000257                       CCC                     ;SCOPE SYNC

030420  062523               I0405:  ADD     (R5)+,(R3)+     ;TEST THE ADD - SM2,DM2

030422  020412                       CMP     R4,(R2)         ;RESULT = #DWTA
030424  001407                       BEQ     A0405           ;BR IF YES

030426  010337  067606               MOV     R3,@#MBUF1      ;SAVE UPDATED DEST ADDR
030432  011203                       MOV     (R2),R3         ;GET WAS DATA
030434  104000               E10405: ERROR                   ;ADD DELIVERED WRONG RESULT
030436  030406                       R0405                   ;ERROR LOOP RETURN

030440  013703  067606               MOV     @#MBUF1,R3      ;RESTORE UPDATED DEST ADDR
030444  022703  067604       A0405:  CMP     #MBUF0+2,R3     ;DID ADD INCREMENT DEST REG?
030450  001402                       BEQ     00405           ;BR IF YES

030452  104005               E20405: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
030454  030406                       R0405                   ;ERROR LOOP RETURN

030456  000004               00405:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
14615                                   ; ***************************************************************************
14616                                         .SBTTL T0406 ADD SM1,DM3 TEST
14617                                   ; ***************************************************************************
14618
14619                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14620
14621                                   ;ROM SEQ:       [141,247,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
14622
14623                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,163 / 33[266]220,225 / 16[367]016,016
14624
14625                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14626
14627                                   ;CODES:         [367] SPS=3
14628
14629                                   ;SYNC:          B05J2 (-) T = 4.5 USEC
14630
14631                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=3L
14632
14633  030460  012700  000406           T0406:  MOV     #0406,R0                ;LOAD R0 WITH THE TEST NO.
14634  030464  013701  030514                   MOV     @#I0406,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14635  030470  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14636  030474  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14637  030500  012705  067566           R0406:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14638  030504  012703  067576                   MOV     #ATA+10,R3      ;[R3] = ADDR OF DEST ADDR
14639  030510  005012                           CLR     (R2)            ;[DEST] = 0
14640  030512  000257                           CCC                     ;SCOPE SYNC
14641
14642  030514  061533           I0406:  ADD     (R5),@(R3)+     ;TEST THE ADD - SM1,DM3
14643
14644  030516  020412                   CMP     R4,(R2)         ;RESULT = #DWTA?
14645  030520  001407                   BEQ     A0406           ;BR IF YES
14646
14647  030522  010337  067606           MOV     R3,@#MBUF1      ;SAVE R3
14648  030526  011203                   MOV     (R2),R3         ;GET WAS DATA
14649  030530  104000           E10406: ERROR                   ;ADD DELIVERED WRONG RESULT
14650  030532  030500                   R0406                   ;ERROR LOOP RETURN
14651
14652  030534  013703  067606           MOV     @#MBUF1,R3      ;RESTORE R3
14653  030540  022703  067600   A0406:  CMP     #ATA+12,R3      ;DID ADD INCREMENT DEST REG
14654  030544  001402                   BEQ     00406           ;BR IF YES
14655
14656  030546  104005           E20406: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
14657  030550  030500                   R0406                   ;ERROR LOOP RETURN
14658
14659  030552  000004           00406:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14660
```

```
14661                                   ; ***************************************************************************
14662                                         .SBTTL T0407 ADD SM2,DM3 TEST
14663                                   ; ***************************************************************************
14664
14665                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14666
14667                                   ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
14668
14669                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016
14670
14671                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14672
14673                                   ;CODES:         [367] SPS=3
14674
14675                                   ;SYNC:          B05J2 (-) T = 3.6 USEC
14676
14677                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=3L
14678
14679  030554  012700  000407           T0407:  MOV     #0407,R0                ;LOAD R0 WITH THE TEST NO.
14680  030560  013701  030610                   MOV     @#I0407,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14681  030564  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14682  030570  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14683  030574  012705  067566           R0407:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14684  030600  012703  067576                   MOV     #ATA+10,R3      ;[R3] = ADDR OF DEST ADDR
14685  030604  005012                           CLR     (R2)            ;[DEST] = 0
14686  030606  000257                           CCC                     ;SCOPE SYNC
14687
14688  030610  062533           I0407:  ADD     (R5)+,@(R3)+    ;TEST THE ADD - SM2,DM3
14689
14690  030612  020412                           CMP     R4,(R2)         ;RESULT = #DWTA?
14691  030614  001407                           BEQ     A0407           ;BR IF YES
14692
14693  030616  010337  067606                   MOV     R3,@#MBUF1      ;SAVE R3
14694  030622  011203                           MOV     (R2),R3         ;GET WAS DATA
14695  030624  104000           E10407: ERROR                           ;ADD DELIVERED WRONG RESULT
14696  030626  030574                           R0407                   ;ERROR LOOP RETURN
14697
14698  030630  013703  067606           A0407:  MOV     @#MBUF1,R3      ;RESTORE R3
14699  030634  022703  067600                   CMP     #ATA+12,R3      ;DID ADD INCREMENT DEST REG
14700  030640  001402                           BEQ     00407           ;BR IF YES
14701
14702  030642  104005           E20407: ERROR5                          ;ADD FAILED TO UPDATE DEST REG
14703  030644  030574                           R0407                   ;ERROR LOOP RETURN
14704
14705  030646  000004           00407:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14706
```

```
14707                                   ; ***************************************************************************
14708                                   .SBTTL TO410 ADD SM1,DM4 TEST
14709                                   ; ***************************************************************************
14710
14711                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14712
14713                                   ;ROM SEQ:       [141,247,250,164,260,267,225,367,375,016] FC 1,2,3,8
14714
14715                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,164 / 33[260]220,225 / 16[367]016,016
14716
14717                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14718
14719                                   ;CODES:         [367] SPS=3
14720
14721                                   ;SYNC:          B05J2 (-) T = 2.6 USEC
14722
14723                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=4L
14724
14725  030650  012700  000410          TO410:  MOV     #0410,R0                ;LOAD R0 WITH THE TEST NO.
14726  030654  013701  030704                  MOV     @#I0410,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14727  030660  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14728  030664  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14729  030670  012705  067566          R0410:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14730  030674  012703  067604                  MOV     #MBUF0+2,R3     ;R3 POINTS TO DEST ADDR +2
14731  030700  005012                          CLR     (R2)            ;[DEST] = 0
14732  030702  000257                          CCC                     ;SCOPE SYNC
14733
14734  030704  061543          I0410:  ADD     (R5),-(R3)      ;TEST THE ADD - SM1,DM4
14735
14736  030706  020412                  CMP     R4,(R2)         ;RESULT = #DWTA?
14737  030710  001407                  BEQ     A0410           ;BR IF YES
14738
14739  030712  010337  067606                  MOV     R3,@#MBUF1      ;SAVE R3
14740  030716  011203                          MOV     (R2),R3         ;GET WAS DATA
14741  030720  104000          E10410: ERROR                   ;ADD DELIVERED WRONG RESULT
14742  030722  030670                  R0410                   ;ERROR LOOP RETURN
14743
14744  030724  013703  067606                  MOV     @#MBUF1,R3      ;RESTORE R3
14745  030730  020302          A0410:  CMP     R3,R2           ;DID ADD INCREMENT DEST REG?
14746  030732  001402                  BEQ     00410           ;BR IF YES
14747
14748  030734  104005          E20410: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
14749  030736  030670                  R0410                   ;ERROR LOOP RETURN
14750
14751  030740  000004          00410:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14752
```

```
14753                                   ; ***************************************************************************
14754                                         .SBTTL T0411 ADD SM2,DM4 TEST
14755                                   ; ***************************************************************************
14756
14757                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14758
14759                                   ;ROM SEQ:       [142,240,250,164,260,267,225,367,375,016] FC 1,2,3,8
14760
14761                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,164 / 33[260]220,225 / 16[367]016,016
14762
14763                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14764
14765                                   ;CODES:         [367] SPS=3
14766
14767                                   ;SYNC:          B05J2 (-) T = 2.6 USEC
14768
14769                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM0=2L  /  K3-3 DM=4L
14770
14771  030742  012700  000411           T0411:  MOV     #0411,R0                ;LOAD R0 WITH THE TEST NO.
14772  030746  013701  030776                   MOV     @#I0411,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14773  030752  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14774  030756  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14775  030762  012705  067566           R0411:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14776  030766  012703  067604                   MOV     #MBUF0+2,R3     ;R3 POINTS TO DEST ADDR +2
14777  030772  005012                           CLR     (R2)            ;[DEST] = 0
14778  030774  000257                           CCC                     ;SCOPE SYNC
14779
14780  030776  061543           I0411:  ADD     (R5),-(R3)      ;TEST THE ADD - SM2,DM4
14781
14782  031000  020412                   CMP     R4,(R2)         ;RESULT = #DWTA?
14783  031002  001407                   BEQ     A0411           ;BR IF YES
14784
14785  031004  010337  067606           MOV     R3,@#MBUF1      ;SAVE R3
14786  031010  011203                   MOV     (R2),R3         ;GET WAS DATA
14787  031012  104000           E10411: ERROR                   ;ADD DELIVERED WRONG RESULT
14788  031014  030762                   R0411                   ;ERROR LOOP RETURN
14789
14790  031016  013703  067606           MOV     @#MBUF1,R3      ;RESTORE R3
14791  031022  020302           A0411:  CMP     R3,R2           ;DID ADD INCREMENT DEST REG?
14792  031024  001402                   BEQ     00411           ;BR IF YES
14793
14794  031026  104005           E20411: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
14795  031030  030762                   R0411                   ;ERROR LOOP RETURN
14796
14797  031032  000004           00411:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14798
```

```
14799                                   ; ***************************************************************************
14800                                   .SBTTL T0412 ADD SM1,DM5 TEST
14801                                   ; ***************************************************************************
14802
14803                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14804
14805                                   ;ROM SEQ:       [141,247,250,165,264,265,266,267,225,367,375,016] FC 1,2,3,8
14806
14807                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,165 / 33[266]220,225 / 16[367]016,016
14808
14809                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14810
14811                                   ;CODES:         [367] SPS=3
14812
14813                                   ;SYNC:          BOSJ2 (-) T = 3.6 USEC
14814
14815                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=5L
14816
14817  031034  012700  000412          T0412:  MOV     #0412,R0                ;LOAD R0 WITH THE TEST NO.
14818  031040  013701  031070                  MOV     @#I0412,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14819  031044  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14820  031050  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14821  031054  012705  067566          R0412:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14822  031060  012703  067600                  MOV     #ATA+12,R3      ;R3 CONTAINS ADDR OF DEST ADDR PLUS 2
14823  031064  005012                          CLR     (R2)            ;[DEST] = 0
14824  031066  000257                          CCC                     ;SCOPE SYNC
14825
14826  031070  061553          I0412:  ADD     (R5),@-(R3)     ;TEST THE ADD - SM1,DM5
14827
14828  031072  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
14829  031074  001407                          BEQ     A0412           ;BR IF YES
14830
14831  031076  010337  067606                  MOV     R3,@#MBUF1      ;SAVE R3
14832  031102  011203                          MOV     (R2),R3         ;GET WAS DATA
14833  031104  104000          E10412: ERROR                   ;ADD DELIVERED WRONG RESULT
14834  031106  031054                  R0412                   ;ERROR LOOP RETURN
14835
14836  031110  013703  067606                  MOV     @#MBUF1,R3      ;RESTORE R3
14837  031114  022703  067576          A0412:  CMP     #ATA+10,R3      ;DID ADD DECREMENT DEST REG?
14838  031120  001402                          BEQ     00412           ;BR IF YES
14839
14840  031122  104005          E20412: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
14841  031124  031054                  R0412                   ;ERROR LOOP RETURN
14842
14843  031126  000004          00412:  SCOPE                   ;CALL SCOPE LOOP UTILITY
14844
```

```
14845                                   ; ***************************************************************************
14846                                           .SBTTL T0413 ADD SM2,DM5 TEST
14847                                   ; ***************************************************************************
14848
14849                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14850
14851                                   ;ROM SEQ:       [142,240,250,165,264,265,266,267,225,367,375,016] FC 1,2,3,8
14852
14853                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,165 / 33[266]220,225 / 16[367]016,016
14854
14855                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14856
14857                                   ;CODES:         [367] SPS = 3
14858
14859                                   ;SYNC:          BOSJ2 (-) T = 3.6 USEC
14860
14861                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=5L
14862
14863  031130  012700  000413          T0413:  MOV     #0413,R0                ;LOAD R0 WITH THE TEST NO.
14864  031134  013701  031164                  MOV     @#I0413,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14865  031140  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14866  031144  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14867  031150  012705  067566          R0413:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14868  031154  012703  067600                  MOV     #ATA+12,R3      ;R3 CONTAINS ADDR OF DEST ADDR PLUS 2
14869  031160  005012                          CLR     (R2)            ;[DEST] = 0
14870  031162  000257                          CCC                     ;SCOPE SYNC
14871
14872  031164  062553                  I0413:  ADD     (R5)+,@-(R3)    ;TEST THE ADD - SM2,DM5
14873
14874  031166  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
14875  031170  001407                          BEQ     A0413           ;BR IF YES
14876
14877  031172  010337  067606                  MOV     R3,@#MBUF1      ;SAVE R3
14878  031176  011203                          MOV     (R2),R3         ;GET WAS DATA
14879  031200  104000                  E10413: ERROR                   ;ADD DELIVERED WRONG RESULT
14880  031202  031150                          R0413                   ;ERROR LOOP RETURN
14881
14882  031204  013703  067606                  MOV     @#MBUF1,R3      ;RESTORE R3
14883  031210  022703  067576          A0413:  CMP     #ATA+10,R3      ;DID ADD DECREMENT DEST REG?
14884  031214  001402                          BEQ     00413           ;BR IF YES
14885
14886  031216  104005                  E20413: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
14887  031220  031150                          R0413                   ;ERROR LOOP RETURN
14888
14889  031222  000004                  00413:  SCOPE   --              ;CALL SCOPE LOOP UTILITY
14890
```

```
14891                                   ; ***************************************************************************
14892                                           .SBTTL T0414 ADD SM1,DM6 TEST
14893                                   ; ***************************************************************************
14894
14895                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14896
14897                                   ;ROM SEQ:       [141,247,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8
14898
14899                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,167 / 17[167]262,262 / 33[266]220,225
14900                                                   ; / 16[367]016,016
14901
14902                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14903
14904                                   ;CODES:         [367] SPS=3
14905
14906                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
14907
14908                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=6L
14909
14910  031224  012700  000414           T0414:  MOV     #0414,R0                ;LOAD R0 WITH THE TEST NO.
14911  031230  013701  031260                   MOV     @#I0414,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14912  031234  012702  067606                   MOV     #MBUF0+4,R2     ;DEST ADDR = MBUF0+4
14913  031240  012704  067612                   MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14914  031244  012705  067566           R0414:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14915  031250  012703  067602                   MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
14916  031254  005012                           CLR     (R2)            ;[DEST] = 0
14917  031256  000257                           CCC                     ;SCOPE SYNC
14918
14919  031260  061563  000004           I0414:  ADD     (R5),4(R3)      ;TEST THE ADD - SM1,DM6
14920
14921  031264  020412                           CMP     R4,(R2)         ;RESULT = #DWTA?
14922  031266  001403                           BEQ     00414           ;BR IF YES
14923
14924  031270  011203                           MOV     (R2),R3         ;GET WAS DATA
14925  031272  104000           E0414:  ERROR                           ;ADD DELIVERED WRONG RESULT
14926  031274  031244                   R0414                           ;ERROR LOOP RETURN
14927
14928  031276  000004           00414:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14929
```

```
14930                                   ; ***************************************************************************
14931                                          .SBTTL T0415 ADD SM2,DM6 TEST
14932                                   ; ***************************************************************************
14933
14934                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
14935
14936                                   ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8
14937
14938                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,262 / 33[266]220,225
14939                                                   ; / 16[367]016,016
14940
14941                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14942
14943                                   ;CODES:         [367] SPS=3
14944
14945                                   ;SYNC:          BOSJ2 (-) T = 3.25 USEC
14946
14947                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=[illegible]L  /  K3-3 DM=6L
14948
14949  031300  012700  000415          T0415:  MOV     #0415,R0                ;LOAD R0 WITH THE TEST NO.
14950  031304  013701  031334                  MOV     @#I0415,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
14951  031310  012702  067606                  MOV     #MBUF0+4,R2     ;DEST ADDR = MBUF0+4
14952  031314  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14953  031320  012705  067566          R0415:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14954  031324  012703  067602                  MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
14955  031330  005012                          CLR     (R2)            ;[DEST] = 0
14956  031332  000257                          CCC                     ;SCOPE SYNC
14957
14958  031334  062563  000004          I0415:  ADD     (R5)+,4(R3)     ;TEST THE ADD - SM2,DM6
14959
14960  031340  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
14961  031342  001403                          BEQ     00415           ;BR IF YES
14962
14963  031344  011203                          MOV     (R2),R3         ;GET WAS DATA
14964  031346  104000          E0415:  ERROR                           ;ADD DELIVERED WRONG RESULT
14965  031350  031320                  R0415                           ;ERROR LOOP RETURN
14966
14967  031352  000004          00415:  SCOPE                           ;CALL SCOPE LOOP UTILITY
14968
```

```
14969                                ; ***************************************************************************
14970                                        .SBTTL T0416 ADD SM1,DM7 TEST
14971                                ; ***************************************************************************
14972
14973                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
14974
14975                                ;ROM SEQ:       [141,247,250,167,261,263,264,265,266,267,225,367,375,016] FC 1,2,3,8
14976
14977                                ;ACT BUTS:      37[004]100,141 / 35[247]120,167 / 17[167]262,263 / 33[266]220,225
14978                                                ; / 16[367]016,016
14979
14980                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
14981
14982                                ;CODES:         [367] SPS=3
14983
14984                                ;SYNC:          B05J2 (-) T = 4.25 USEC
14985
14986                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=7L
14987
14988  031354  012700  000416        T0416:  MOV     #0416,R0                ;LOAD R0 WITH THE TEST NO.
14989  031360  013701  031406                MOV     #I0416,R1       ;LOAD R1 WITH TEST INSTRUCTION WORD
14990  031364  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
14991  031370  012704  067612                MOV     #DWTA,R4        ;RESULT S / B = #DWTA
14992  031374  012705  067566        R0416:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
14993  031400  010503                        MOV     R5,R3           ;BASE DEST ADDR = ATA
14994  031402  005012                        CLR     (R2)            ;[DEST] = 0
14995  031404  000257                        CCC                     ;SCOPE SYNC
14996
14997  031406  061573  000010        I0416:  ADD     (R5),@10(R3)    ;TEST THE ADD - SM1,DM7
14998
14999  031412  020412                        CMP     R4,(R2)         ;RESULT = #DWTA?
15000  031414  001403                        BEQ     00416           ;BR IF YES
15001
15002  031416  011203                        MOV     (R2),R3         ;GET WAS DATA
15003  031420  104000        E0416:  ERROR                           ;ADD DELIVERED WRONG RESULT
15004  031422  031374                        R0416                   ;ERROR LOOP RETURN
15005
15006  031424  000004        00416:  SCOPE                           ;CALL SCOPE LOOP UTILITY
15007
```

```
15008                                   ; ***************************************************************************
15009                                           .SBTTL T0417 ADD SM2,DM7 TEST
15010                                   ; ***************************************************************************
15011
15012                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15013
15014                                   ;ROM SEQ:       [142,240,250,167,261,263,264,265,266,267,225,367,375,016] FC 1,2,3,8
15015
15016                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,263 / 33[266]220,225
15017                                                   ; / 16[367]016,016
15018
15019                                   ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA
15020
15021                                   ;CODES:         [367] SPS=3
15022
15023                                   ;SYNC:          B05J2 (-) T = 4.25 USEC
15024
15025                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=7L
15026
15027  031426  012700  000417          T0417:  MOV     #0417,R0                ;LOAD R0 WITH THE TEST NO.
15028  031432  013701  031460                  MOV     @#I0417,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15029  031436  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15030  031442  012704  067612                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
15031  031446  012705  067566          R0417:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
15032  031452  010503                          MOV     R5,R3           ;BASE DEST ADDR = ATA
15033  031454  005012                          CLR     (R2)            ;[DEST] = 0
15034  031456  000257                          CCC                     ;SCOPE SYNC
15035
15036  031460  062573  000010          I0417:  ADD     (R5)+,@10(R3)   ;TEST THE ADD - SM2,DM7
15037
15038  031464  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
15039  031466  001403                          BEQ     00417           ;BR IF YES
15040
15041  031470  011203                          MOV     (R2),R3         ;GET WAS DATA
15042  031472  104000          E0417:  ERROR                           ;ADD DELIVERED WRONG RESULT
15043  031474  031446                  R0417                           ;ERROR LOOP RETURN
15044
15045  031476  000004          00417:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
15046                                   ; ***************************************************************************
15047                                          .SBTTL T0420 "XOR RA,RB" TEST - A=B=000000 N:C=1010
15048                                   ; ***************************************************************************
15049
15050                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15051
15052                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
15053
15054                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
15055
15056                                   ;EXEC:          [364]ALUC=HLHHL :[360]D=000000
15057
15058                                   ;CODES:         [360] SPS=3  /  N:C=0100
15059
15060                                   ;SYNC:          B05J2 (-)       /       T=1 USEC
15061
15062                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H
15063
15064  031500  012700  000420          T0420:  MOV     #0420,R0                ;LOAD R0 WITH TEST NO.
15065  031504  013701  031524                  MOV     @#I0420,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15066  031510  005004                          CLR     R4              ;RESULT AND MASK = 000000
15067  031512  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
15068  031516  005003                  R0420:  CLR     R3              ;[DEST] = 000000
15069  031520  000257                          CCC                     ;SCOPE SYNC
15070  031522  000272                          272                     ;MAKE N:C=1010
15071
15072  031524  074403                  I0420:  XOR     R4,R3           ;TEST THE XOR
15073
15074  031526  100403                          BMI     E10420          ;N:C=0100 ??
15075  031530  001002                          BNE     E10420
15076  031532  102401                          BVS     E10420
15077  031534  103002                          BCC     A0420
15078
15079  031536  104000                  E10420: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
15080  031540  031516                          R0420                   ;ERROR LOOP RETURN ADDRESS
15081
15082  031542  020403                  A0420:  CMP     R4,R3           ;RESULT CORRECT?
15083  031544  001402                          BEQ     00420           ;BR IF YES
15084
15085  031546  104000                  E20420: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15086  031550  031516                          R0420                   ;ERROR LOOP RETURN ADDRESS
15087
15088  031552  000004                  00420:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15089
```

```
15090                                   ; ***************************************************************************
15091                                          .SBTTL T0421 "XOR RA,RB" TEST - A=B=177777 N:C=0101
15092                                   ; ***************************************************************************
15093
15094                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15095
15096                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
15097
15098                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
15099
15100                                   ;EXEC:          [364]ALUC=HLHHL :[360]D=000000
15101
15102                                   ;CODES:         [360] SPS=3  /  N:C=0101
15103
15104                                   ;SYNC:          BOSJ2 (-)       /       T=1 USEC
15105
15106                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H
15107
15108  031554  012700  000421          T0421:  MOV     #0421,R0                ;LOAD R0 WITH TEST NO.
15109  031560  013701  031604                  MOV     @#I0421,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15110  031564  005004                          CLR     R4              ;RESULT  = 000000
15111  031566  012705  177777                  MOV     #-1,R5          ;MASK = 177777
15112  031572  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
15113  031576  010503                  R0421:  MOV     R5,R3           ;[DEST]=177777
15114  031600  000257                          CCC                     ;SCOPE SYNC
15115  031602  000265                          265                     ;MAKE N:C=0101
15116
15117  031604  074503                  I0421:  XOR     R5,R3           ;TEST THE XOR
15118
15119  031606  100403                          BMI     E10421          ;N:C=0101 ??
15120  031610  001002                          BNE     E10421
15121  031612  102401                          BVS     E10421
15122  031614  103402                          BCS     A0421
15123
15124  031616  104000                  E10421: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
15125  031620  031576                          R0421                   ;ERROR LOOP RETURN ADDRESS
15126
15127  031622  020403                  A0421:  CMP     R4,R3           ;RESULT CORRECT?
15128  031624  001402                          BEQ     00421           ;BR IF YES
15129
15130  031626  104000                  E20421: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15131  031630  031576                          R0421                   ;ERROR LOOP RETURN ADDRESS
15132
15133  031632  000004                  00421:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15134
```

```
15135                                   ; ***************************************************************************
15136                                          .SBTTL T0422 "XOR RA,RB" TEST - A=125252,B=052525 N:C=0110
15137                                   ; ***************************************************************************
15138
15139                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15140
15141                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
15142
15143                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
15144
15145                                   ;EXEC:          [364]ALUC=HLHHL :[360]D=177777
15146
15147                                   ;CODES:         [360] SPS=3  /  N:C=1000
15148
15149                                   ;SYNC:          B05J2 (-)       /       T=1 USEC
15150
15151                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H
15152
15153  031634  012700  000422           T0422:  MOV     #0422,R0                ;LOAD R0 WITH TEST NO.
15154  031640  013701  031670                   MOV     @#I0422,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15155  031644  012704  177777                   MOV     #-1,R4          ;RESULT S/B = 177777
15156  031650  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
15157  031654  012705  125252                   MOV     #125252,R5      ;MASK=125252
15158  031660  012703  052525           R0422:  MOV     #052525,R3      ;[DEST] = 052525
15159  031664  000257                           CCC                     ;SCOPE SYNC
15160  031666  000266                           266                     ;MAKE N:C=0110
15161
15162  031670  074503                   I0422:  XOR     R5,R3           ;TEST THE XOR
15163
15164  031672  100003                           BPL     E10422          ;N:C=1000 ??
15165  031674  001402                           BEQ     E10422
15166  031676  102401                           BVS     E10422
15167  031700  103002                           BCC     A0422
15168
15169  031702  104000                   E10422: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
15170  031704  031660                           R0422                   ;ERROR LOOP RETURN ADDRESS
15171
15172  031706  020403                   A0422:  CMP     R4,R3           ;RESULT CORRECT?
15173  031710  001402                           BEQ     00422           ;BR IF YES
15174
15175  031712  104000                   E20422: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15176  031714  031660                           R0422                   ;ERROR LOOP RETURN ADDRESS
15177
15178  031716  000004                   00422:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15179
```

```
15180                                   ; ***************************************************************************
15181                                           .SBTTL T0423 "XOR RA,RB" TEST - A=052525,B=125252 N:C=1001
15182                                   ; ***************************************************************************
15183
15184                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15185
15186                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
15187
15188                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
15189
15190                                   ;EXEC:          [364]ALUC=HLHHL :[360]D=000000
15191
15192                                   ;CODES:         [360] SPS=3  /  N:C=1001
15193
15194                                   ;SYNC:          B05J2 (-)       /       T=1 USEC
15195
15196                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H
15197
15198  031720  012700  000423          T0423:  MOV     #0423,R0                ;LOAD R0 WITH TEST NO.
15199  031724  013701  031754                  MOV     @#I0423,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15200  031730  012704  177777                  MOV     #-1,R4          ;RESULT S/B = 177777
15201  031734  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
15202  031740  012705  052525                  MOV     #52525,R5       ;MASK=052525
15203  031744  012703  125252          R0423:  MOV     #125252,R3      ;[DEST] = 125252
15204  031750  000257                          CCC                     ;SCOPE SYNC
15205  031752  000271                          271                     ;MAKE N:C=1001
15206
15207  031754  074503.                  I0423:  XOR     R5,R3           ;TEST THE XOR
15208
15209  031756  100003                          BPL     E10423          ;N:C=1001 ??
15210  031760  001402                          BEQ     E10423
15211  031762  102401                          BVS     E10423
15212  031764  103402                          BCS     A0423
15213
15214  031766  104000                  E10423: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
15215  031770  031744                          R0423                   ;ERROR LOOP RETURN ADDRESS
15216
15217  031772  020403                  A0423:  CMP     R4,R3           ;RESULT CORRECT?
15218  031774  001402                          BEQ     00423           ;BR IF YES
15219
15220  031776  104000                  E20423: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15221  032000  031744                          R0423                   ;ERROR LOOP RETURN ADDRESS
15222
15223  032002  000004                  00423:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15224
```

```
15225                                   ; ***************************************************************************
15226                                          .SBTTL T0424 "XOR RA,(RB)" TEST - A=B=000000 N:C=1010
15227                                   ; ***************************************************************************
15228
15229                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15230
15231                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
15232
15233                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
15234
15235                                   ;EXEC:          [224]ALUC=HLHHL :[367]D=000000
15236
15237                                   ;CODES:         [367] SPS=3  /  N:C=0100
15238
15239                                   ;SYNC:          B05J2 (-)       /       T=2.6 USEC
15240
15241                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L
15242
15243  032004  012700  000424          T0424:  MOV     #0424,R0                ;LOAD R0 WITH TEST NO.
15244  032010  013701  032032                  MOV     @#I0424,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15245  032014  005004                          CLR     R4              ;RESULT S / B = 000000
15246  032016  005005                          CLR     R5              ;MASK = 000000
15247  032020  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15248  032024  005012                  R0424:  CLR     (R2)            ;[DEST] = 000000
15249  032026  000257                          CCC                     ;SCOPE SYNC
15250  032030  000272                          272                     ;MAKE N:C=1010
15251
15252  032032  074512                  I0424:  XOR     R5,(R2)         ;TEST THE XOR
15253
15254  032034  100403                          BMI     E10424          ;N:C = 0100 ??
15255  032036  001002                          BNE     E10424
15256  032040  102401                          BVS     E10424
15257  032042  103002                          BCC     A0424
15258
15259  032044  104000                  E10424: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
15260  032046  032024                          R0424                   ;ERROR LOOP RETURN ADDRESS
15261
15262  032050  020412                  A0424:  CMP     R4,(R2)         ;RESULT CORRECT?
15263  032052  001403                          BEQ     00424           ;BR IF YES
15264
15265  032054  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15266  032056  104000                  E20424: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15267  032060  032024                          R0424                   ;ERROR LOOP RETURN ADDRESS
15268
15269  032062  000004                  00424:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15270
```

```
15271                                   ; ************************************************************************
15272                                          .SBTTL T0425 "XOR RA,(RB)" TEST - A=B=177777 N:C=0101
15273                                   ; ************************************************************************
15274
15275                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15276
15277                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
15278
15279                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
15280
15281                                   ;EXEC:          [224]ALUC=HLHHL :[367]D=000000
15282
15283                                   ;CODES:         [367] SPS=3  /  N:C=0101
15284
15285                                   ;SYNC:          B05J2 (-)       /       T=2.6 USEC
15286
15287                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L
15288
15289  032064  012700  000425          T0425:  MOV     #0425,R0                ;LOAD R0 WITH TEST NO.
15290  032070  013701  032116                  MOV     @#I0425,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15291  032074  005004                          CLR     R4              ;RESULT S / B = 000000
15292  032076  012705  177777                  MOV     #-1,R5          ;MASK = 177777
15293  032102  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15294  032106  012712  177777          RD425:  MOV     #-1,(R2)        ;[DEST] = 177777
15295  032112  000257                          CCC                     ;SCOPE SYNC
15296  032114  000265                          265                     ;MAKE N:C=0101
15297
15298  032116  074512                  I0425:  XOR     R5,(R2)         ;TEST THE XOR
15299
15300  032120  100403                          BMI     E10425          ;N:C = 0101 ??
15301  032122  001002                          BNE     E10425
15302  032124  102401                          BVS     E10425
15303  032126  103402                          BCS     A0425
15304
15305  032130  104000                  E10425: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
15306  032132  032106                          RD425                   ;ERROR LOOP RETURN ADDRESS
15307
15308  032134  020412                  A0425:  CMP     R4,(R2)         ;RESULT CORRECT?
15309  032136  001403                          BEQ     00425           ;BR IF YES
15310
:5311  032140  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15312  032142  104000                  E20425: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15313  032144  032106                          RD425                   ;ERROR LOOP RETURN ADDRESS
15314
15315  032146  000004                  00425:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15316
```

```
15317                                   ; ***************************************************************************
15318                                           .SBTTL T0426 "XOR RA,(RB)" TEST - A=125252,B=052525 N:C=0110
15319                                   ; ***************************************************************************
15320
15321                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15322
15323                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
15324
15325                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
15326
15327                                   ;EXEC:          [224]ALUC=HLHHL :[367]D=00177777
15328
15329                                   ;CODES:         [367] SPS=3  /  N:C=1000
15330
15331                                   ;SYNC:          B05J2 (-)       /       T=2.6 USEC
15332
15333                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L
15334
15335  032150  012700  000426          T0426:  MOV     #0426,R0                ;LOAD R0 WITH TEST NO.
15336  032154  013701  032204                  MOV     @#I0426,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15337  032160  012704  177777                  MOV     #-1,R4          ;RESULT S/B = 177777
15338  032164  012705  125252                  MOV     #125252,R5      ;MASK = 125252
15339  032170  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15340  032174  012712  052525          R0426:  MOV     #052525,(R2)    ;[DEST] = 052525
15341  032200  000257                          CCC                     ;SCOPE SYNC
15342  032202  000266                          266                     ;MAKE N:C=0110
15343
15344  032204  074512                  I0426:  XOR     R5,(R2)         ;TEST THE XOR
15345
15346  032206  100003                          BPL     E10426          ;N:C = 1000 ??
15347  032210  001402                          BEQ     E10426
15348  032212  102401                          BVS     E10426
15349  032214  103002                          BCC     A0426
15350
15351  032216  104000                  E10426: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
15352  032220  032174                          R0426                   ;ERROR LOOP RETURN ADDRESS
15353
15354  032222  020412                  A0426:  CMP     R4,(R2)         ;RESULT CORRECT?
15355  032224  001403                          BEQ     00426           ;BR IF YES
15356
15357  032226  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15358  032230  104000                  E20426: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15359  032232  032174                          R0426                   ;ERROR LOOP RETURN ADDRESS
15360
15361  032234  000004                  00426:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15362
```

```
15363                                   ; ***************************************************************************
15364                                         .SBTTL T0427 "XOR RA,(RB)" TEST - A=052525,B=125252 N:C=1001
15365                                   ; ***************************************************************************
15366
15367                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15368
15369                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
15370
15371                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
15372
15373                                   ;EXEC:          [224]ALUC=HLHHL :[367]D=177777
15374
15375                                   ;CODES:         [367] SPS=3  /  N:C=1001
15376
15377                                   ;SYNC:          B05J2 (-)       /       T=2.6 USEC
15378
15379                                   ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L
15380
15381  032236  012700  000427          T0427:  MOV     #0427,R0                ;LOAD R0 WITH TEST NO.
15382  032242  013701  032272                  MOV     @#I0427,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15383  032246  012704  177777                  MOV     #-1,R4          ;RESULT S/B = 177777
15384  032252  012705  052525                  MOV     #52525,R5       ;MASK = 052525
15385  032256  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15386  032262  012712  125252          R0427:  MOV     #125252,(R2)    ;[DEST] = 125252
15387  032266  000257                          CCC                     ;SCOPE SYNC
15388  032270  000271                          271                     ;MAKE N:C=1001
15389
15390  032272  074512                  I0427:  XOR     R5,(R2)         ;TEST THE XOR
15391
15392  032274  100003                          BPL     E10427          ;N:C = 1001 ??
15393  032276  001402                          BEQ     E10427
15394  032300  102401                          BVS     E10427
15395  032302  103402                          BCS     A0427
15396
15397  032304  104000                  E10427: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
15398  032306  032262                          R0427                   ;ERROR LOOP RETURN ADDRESS
15399
15400  032310  020412                  A0427:  CMP     R4,(R2)         ;RESULT CORRECT?
15401  032312  001403                          BEQ     00427           ;BR IF YES
15402
15403  032314  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15404  032316  104000                  E20427: ERROR                   ;XOR DELIVERED THE WRONG RESULT
15405  032320  032262                          R0427                   ;ERROR LOOP RETURN ADDRESS
15406
15407  032322  000004                  00427:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
15408
15409
```

```
15410                                   ; ************************************************************************
15411                                          .SBTTL T0430 SUB TEST SM0,DM0 - (SRC) = (DEST) = +,+
15412                                   ; ************************************************************************
15413
15414                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15415
15416                                   ;ROM SEQ:       [103,363,360,001] FC 1,7,8
15417
15418                                   ;ACT BUTS:      37[004]100,103 / 27[363]000,001
15419
15420                                   ;EXEC:          [363]ALUC=LLHHL :[360] D = 000000
15421
15422                                   ;CODES:         [360] SPS=3  /  N:C = 0100
15423
15424                                   ;SYNC:          B05J2 (-) T = 1 USEC
15425
15426                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
15427                                                   ;  K3-8 CIN00 L
15428
15429  032324  012700  000430          T0430:  MOV     #0430,R0                ;LOAD R0 WITH TEST NO.
15430  032330  013701  032354                  MOV     @#I0430,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15431
15432  032334  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
15433  032340  005004                          CLR     R4              ;RESULT S / B = 0
15434  032342  012703  052525          R0430:  MOV     #052525,R3      ;[R3] = DEST OP = 52525
15435  032346  010305                          MOV     R3,R5           ;[R5] = SRC OP = 52525
15436  032350  000257                          CCC                     ;CLEAR FLAGS
15437  032352  000273                          273                     ;MAKE N:C = 1011
15438
15439  032354  160503          I0430:  SUB     R5,R3           ;TEST THE SUB
15440
15441  032356  100403                  BMI     E10430
15442  032360  001002                  BNE     E10430          ;DID N:C = 0100
15443  032362  102401                  BVS     E10430
15444  032364  103002                  BCC     A0430
15445
15446  032366  104000          E10430: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
15447  032370  032342                  R0430                   ;ERROR LOOP RETURN
15448
15449  032372  020304          A0430:  CMP     R3,R4           ;WAS RESULT = 0?
15450  032374  001402                  BEQ     00430           ;BR IF YES
15451
15452  032376  104000          E20430: ERROR                   ;SUB DELIVERED WRONG RESULT
15453  032400  032342                  R0430                   ;ERROR LOOP RETURN
15454
15455  032402  000004           00430: SCOPE                   ;CALL SCOPE LOOP UTILITY
15456
15457
```

```
15458                                   ; ***************************************************************************
15459                                         .SBTTL T0431 SUB TEST SM0,DM0 - (SRC) = (DEST) = -,-
15460                                   ; ***************************************************************************
15461
15462                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15463
15464                                   ;ROM SEQ:       [103,363,360,001] FC 1,7,8
15465
15466                                   ;ACT BUTS:      37[004]100,103 / 27[363]000,001
15467
15468                                   ;EXEC:          [363]ALUC=LLHHL :[360] D = 000000
15469
15470                                   ;CODES:         [360] SPS=3  /  N:C = 0100
15471
15472                                   ;SYNC:          B05J2 (-) T = 1 USEC
15473
15474                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
15475                                   ;  K3-8 CIN00 L
15476
15477  032404  012700  000431  T0431:  MOV     #0431,R0                ;LOAD R0 WITH TEST NO.
15478  032410  013701  032434          MOV     @#I0431,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15479
15480  032414  012702  177703          MOV     #177703,R2      ;DEST ADDR  = R3
15481  032420  005004                  CLR     R4              ;RESULT S / B = 0
15482  032422  012703  125252  R0431:  MOV     #125252,R3      ;[R3] = DEST OP = 125252
15483  032426  010305                  MOV     R3,R5           ;[R5] = SOURCE OP = 125252
15484  032430  000257                  CCC                     ;CLEAR FLAGS
15485  032432  000273                  273                     ;MAKE N:C = 1011
15486
15487  032434  160503          I0431:  SUB     R5,R3           ;TEST THE SUB
15488
15489  032436  100403                  BMI     E10431
15490  032440  001002                  BNE     E10431          ;N:C = 0100?
15491  032442  102401                  BVS     E10431
15492  032444  103002                  BCC     A0431
15493
15494  032446  104000          E10431: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
15495  032450  032422                  R0431                   ;ERROR LOOP RETURN
15496
15497  032452  020304          A0431:  CMP     R3,R4           ;RESULT = 0?
15498  032454  001402                  BEQ     00431           ;BR IF YES
15499
15500  032456  104000          E20431: ERROR                   ;SUB DELIVERED WRONG RESULT
15501  032460  032422                  R0431                   ;ERROR LOOP RETURN
15502
15503  032462  000004           00431: SCOPE                   ;CALL SCOPE LOOP UTILITY
15504
15505
```

```
15506                                   ; ***************************************************************
15507                                          .SBTTL T0432 SUB TEST SM0,DM0 - (SRC) = (DEST) = -,+
15508                                   ; ***************************************************************
15509
15510                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15511
15512                                   ;ROM SEQ:       [103,363,360,001] FC 1,7,8
15513
15514                                   ;ACT BUTS:      37[004]100,103 / 27[363]000,001
15515
15516                                   ;EXEC:          [363]ALUC=LLHHL :[360] D = 000002
15517
15518                                   ;CODES:         [360] SPS=3  /  N:C = 0001
15519
15520                                   ;SYNC:          B05J2 (-) T = 1 USEC
15521
15522                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H
15523                                                   ;  K3-8 CIN00 L
15524
15525  032464  012700  000432          T0432:  MOV     #0432,R0                ;LOAD R0 WITH TEST NO.
15526  032470  013701  032520                  MOV     @#I0432,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15527
15528  032474  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
15529  032500  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
15530  032504  012703  000001          R0432:  MOV     #1,R3           ;[R3] = DEST OP = 1
15531  032510  012705  177777                  MOV     #-1,R5          ;[R5] = SRC OP = -1
15532  032514  000257                          CCC                     ;CLEAR FLAGS
15533  032516  000276                          276                     ;MAKE N:C = 1110
15534
15535  032520  160503          I0432:  SUB     R5,R3                   ;TEST THE SUB
15536
15537  032522  100403                  BMI     E10432
15538  032524  001402                  BEQ     E10432          ;N:C = 0001
15539  032526  102401                  BVS     E10432
15540  032530  103402                  BCS     A0432
15541
15542  032532  104000          E10432: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
15543  032534  032504                  R0432                   ;ERROR LOOP RETURN
15544
15545  032536  020304          A0432:  CMP     R3,R4           ;RESULT = +2?
15546  032540  001402                  BEQ     00432           ;BR IF YES
15547
15548  032542  104000          E20432: ERROR                   ;SUB DELIVERED WRONG RESULT
15549  032544  032504                  R0432                   ;ERROR LOOP RETURN
15550
15551  032546  000004           00432: SCOPE                   ;CALL SCOPE LOOP UTILITY
15552
15553
```

```
15554                                   ; ***************************************************************
15555                                          .SBTTL T0433 SUB TEST SMD,DMD (SRC) = -(DEST) = +,-
15556                                   ; ***************************************************************
15557
15558                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15559
15560                                   ;ROM SEQ:       [103,363,360,001] FC 1,7,8
15561
15562                                   ;ACT BUTS:      37[004]100,103 / 27[363]000,001
15563
15564                                   ;EXEC:          [363]ALUC=LLHHL :[360] D = 177776
15565
15566                                   ;CODES:         [360] SPS=3  /  N:C = 1000
15567
15568                                   ;SYNC:          B05J2 (-) T = 1 USEC
15569
15570                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
15571                                                   ;  K3-8 CIN00 L
15572
15573  032550  012700  000433          T0433:  MOV     #0433,R0                ;LOAD R0 WITH TEST NO.
15574  032554  013701  032604                  MOV     @#I0433,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15575
15576  032560  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
15577  032564  012704  177776                  MOV     #-2,R4          ;RESULT S / B = -2
15578  032570  012703  177777          R0433:  MOV     #-1,R3          ;[R3] = [DEST] = -1
15579  032574  012705  000001                  MOV     #1,R5           ;[R5] = [SOURCE] = +1
15580  032600  000257                          CCC                     ;CLEAR FLAGS
15581  032602  000267                          267                     ;MAKE N:C = 0111
15582
15583  032604  160503          I0433:  SUB     R5,R3           ;TEST THE SUB
15584
15585  032606  100003                  BPL     E10433
15586  032610  001402                  BEQ     E10433          ;N:C = 1000
15587  032612  102401                  BVS     E10433
15588  032614  103002                  BCC     A0433
15589
15590  032616  104000          E10433: ERROR                   ;SUB DID NOT ALTER CODES PROPERLY
15591  032620  032570                  R0433                   ;ERROR LOOP RETURN
15592
15593  032622  020403          A0433:  CMP     R4,R3           ;RESULT = -2?
15594  032624  001402                  BEQ     00433           ;BR IF YES
15595
15596  032626  104000          E20433: ERROR                   ;SUB DELIVERED WRONG RESULT
15597  032630  032570                  R0433                   ;ERROR LOOP RETURN
15598
15599  032632  000004           00433: SCOPE                   ;CALL SCOPE LOOP UTILITY
15600
15601
```

```
15602                                   ; ***************************************************************
15603                                          .SBTTL T0434 SUB TEST SMO,DMO - "V" BIT SETS
15604                                   ; ***************************************************************
15605
15606                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15607
15608                                   ;ROM SEQ:       [103,363,360,001] FC 1,7,8
15609
15610                                   ;ACT BUTS:      37[004]100,103 / 27[363]000,001
15611
15612                                   ;EXEC:          [363]ALUC=LLHHL :[360] D = 77777
15613
15614                                   ;CODES:         [360] SPS=3  /  N:C = 0011
15615
15616                                   ;SYNC:          B05J2 (-) T = 1 USEC
15617
15618                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
15619                                                   ;  K3-8 CIN00 L
15620
15621  032634  012700  000434          T0434:  MOV     #0434,R0                ;LOAD R0 WITH TEST NO.
15622  032640  013701  032670                  MOV     @#I0434,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15623
15624  032644  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
15625  032650  012704  077777                  MOV     #77777,R4       ;RESULT = 77777
15626  032654  012703  100000          R0434:  MOV     #100000,R3      ;[R3] = DEST OP = 100000
15627  032660  012705  000001                  MOV     #1,R5           ;[R5] = SRC OP = 1
15628  032664  000257                          CCC                     ;CLEAR FLAGS
15629  032666  000274                          274                     ;MAKE N:C = 1100
15630
15631  032670  160503          I0434:  SUB     R5,R3           ;TEST THE SUB
15632
15633  032672  100403                  BMI     E10434
15634  032674  001402                  BEQ     E10434          ;N:C = 0011 ("V" BIT SHOULD SET)
15635  032676  102001                  BVC     E10434
15636  032700  103002                  BCC     A0434
15637
15638  032702  104000          E10434: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
15639  032704  032654                  R0434                   ;ERROR LOOP RETURN
15640
15641  032706  020304          A0434:  CMP     R3,R4           ;RESULT = 77777?
15642  032710  001402                  BEQ     00434           ;BR IF YES
15643
15644  032712  104000          E20434: ERROR                   ;SUB DELIVERED WRONG RESULT
15645  032714  032654                  R0434                   ;ERROR LOOP RETURN
15646
15647  032716  000004           00434: SCOPE                   ;CALL SCOPE LOOP UTILITY
15648
15649
```

```
15650                                   ; ***************************************************************************
15651                                          .SBTTL T0435 SUB TEST - SM0,DM1 - (N:C) = 0110
15652                                   ; ***************************************************************************
15653
15654                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15655
15656                                   ;ROM SEQ:       [161,266,267,226,365,367,375,016] FC 1,3,8
15657
15658                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016
15659
15660                                   ;EXEC:          [365]ALUC=LLHHL :[367] D = 177777
15661
15662                                   ;CODES:         [367] SPS=3  /  N:C = 1001
15663
15664                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
15665
15666                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L
15667
15668  032720  012700  000435           T0435:  MOV     #0435,R0                ;LOAD R0 WITH TEST NO.
15669  032724  013701  032752                   MOV     @#I0435,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15670  032730  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15671  032734  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
15672  032740  012705  000001                   MOV     #+1,R5          ;SRC OPR = +1
15673  032744  005012                   R0435:  CLR     (R2)            ;[DEST] = 000000
15674  032746  000257                           CCC                     ;CLEAR FLAGS
15675  032750  000266                           266                     ;N:C = 0110
15676
15677  032752  160512                   I0435:  SUB     R5,(R2)         ;TEST THE SUB
15678
15679  032754  100003                           BPL     E10435          ;N:C = 1001
15680  032756  001402                           BEQ     E10435
15681  032760  102401                           BVS     E10435
15682  032762  103402                           BCS     A0435
15683
15684  032764  104005                   E10435: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15685  032766  032744                           R0435                   ;ERROR LOOP RETURN ADDRESS
15686
15687  032770  020412                   A0435:  CMP     R4,(R2)         ;CORRECT RESULT ?
15688  032772  001403                           BEQ     00435           ;BR IF YES
15689
15690  032774  011203                           MOV     (R2),R3         ;GET THE WAS DATA
15691  032776  104000                   E20435: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15692  033000  032744                           R0435                   ;ERROR LOOP RETURN ADDRESS
15693
15694  033002  000004                   00435:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15695                                   ; ***************************************************************************
15696                                          .SBTTL T0436 SUB TEST - SM0,DM1 - <N:C> = 1010
15697                                   ; ***************************************************************************
15698
15699                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15700
15701                                   ;ROM SEQ:       1616,266,267,226,365,367,375,016] FC 1,3,8
15702
15703                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016
15704
15705                                   ;EXEC:          [365]ALUC=LLHHL :[367] D = 000000
15706
15707                                   ;CODES:         [367] SPS=3  /  N:C = 0100
15708
15709                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
15710
15711                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L
15712
15713  033004  012700  000436          T0436:  MOV     #0436,R0                ;LOAD R0 WITH TEST NO.
15714  033010  013701  033036                  MOV     @#I0436,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15715  033014  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15716  033020  005004                          CLR     R4              ;RESULT S / B = 000000
15717  033022  012705  177777                  MOV     #-1,R5          ;SRC OPR = 177777
15718  033026  012712  177777          R0436:  MOV     #-1,(R2)        ;[DEST] = 177777
15719  033032  000257                          CCC                     ;CLEAR FLAGS
15720  033034  000272                          272                     ;N:C = 1010
15721
15722  033036  160512                  I0436:  SUB     R5,(R2)         ;TEST THE SUB
15723
15724  033040  100403                          BMI     E10436          ;N:C = 0100
15725  033042  001002                          BNE     E10436
15726  033044  102401                          BVS     E10436
15727  033046  103002                          BCC     A0436
15728
15729  033050  104005                  E10436: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15730  033052  033026                          R0436                   ;ERROR LOOP RETURN ADDRESS
15731
15732  033054  020412                  A0436:  CMP     R4,(R2)         ;CORRECT RESULT ?
15733  033056  001403                          BEQ     00436           ;BR IF YES
15734
15735  033060  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15736  033062  104000                  E20436: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15737  033064  033026                          R0436                   ;ERROR LOOP RETURN ADDRESS
15738
15739  033066  000004                  00436:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15740                                   ; ***************************************************************
15741                                          .SBTTL T0437 SUB TEST - SM0,DM1 - ‹N:C› = 0000
15742                                   ; ***************************************************************
15743
15744                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15745
15746                                   ;ROM SEQ:       [161,266,267,226,365,367,375,016] FC 1,3,8
15747
15748                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016
15749
15750                                   ;EXEC:          [365]ALUC=LLHHL :[367] D = 77777
15751
15752                                   ;CODES:         [367] SPS=3  /  N:C = 0010
15753
15754                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
15755
15756                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L
15757
15758  033070  012700  000437          T0437:  MOV     #0437,R0                ;LOAD R0 WITH TEST NO.
15759  033074  013701  033122                  MOV     @#I0437,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15760  033100  012702  067602                  MOV     #^MBUF0,R2      ;DEST ADDR = MBUF0
15761  033104  012704  077777                  MOV     #77777,R4       ;RESULT S / B = 77777
15762  033110  012705  000001                  MOV     #+1,R5          ;SRC OPR = +1
15763  033114  012712  100000          R0437:  MOV     #100000,(R2)    ;[DEST] = 100000
15764  033120  000257                          CCC                     ;CLEAR FLAGS
15765
15766  033122  160512                  I0437:  SUB     R5,(R2)         ;TEST THE SUB
15767
15768  033124  100403                          BMI     E10437          ;N:C = 0010
15769  033126  001402                          BEQ     E10437
15770  033130  102001                          BVC     E10437
15771  033132  103002                          BCC     A0437
15772
15773  033134  104005                  E10437: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15774  033136  033114                          R0437                   ;ERROR LOOP RETURN ADDRESS
15775
15776  033140  020412                  A0437:  CMP     R4,(R2)         ;CORRECT RESULT ?
15777  033142  001403                          BEQ     00437           ;BR IF YES
15778
15779  033144  011203                          MOV     (R2),R3         ;GET THE WAS DATA
15780  033146  104000                  E20437: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15781  033150  033114                          R0437                   ;ERROR LOOP RETURN ADDRESS
15782
15783  033152  000004                  00437:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15784                                   ; ***************************************************************************
15785                                          .SBTTL T0440 SUB TEST - SM1,DM0 - <N:C> = 0110
15786                                   ; ***************************************************************************
15787
15788                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15789
15790                                   ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8
15791
15792                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000
15793
15794                                   ;EXEC:          [370]ALUC=LLHHL :[360] D = 177777
15795
15796                                   ;CODES:         [360] SPS=3  /  N:C = 1001
15797
15798                                   ;SYNC:          BOSJ2 (-) T = 2.7 USEC
15799
15800                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L
15801
15802  033154  012700  000440          T0440:  MOV     #0440,R0                ;LOAD R0 WITH TEST NO.
15803  033160  013701  033206                  MOV     @#I0440,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15804  033164  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
15805  033170  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
15806  033174  012705  070140                  MOV     #DWTB+2,R5      ;SRC ADDR = DWTB+2
15807  033200  005003                  R0440:  CLR     R3              ;[DEST] = 000000
15808  033202  000257                          CCC                     ;CLEAR FLAGS
15809  033204  000266                          266                     ;N:C = 0110
15810
15811  033206  161503                  I0440:  SUB     (R5),R3         ;TEST THE SUB
15812
15813  033210  100003                          BPL     E10440          ;N:C = 1001
15814  033212  001402                          BEQ     E10440
15815  033214  102401                          BVS     E10440
15816  033216  103402                          BCS     A0440
15817
15818  033220  104005                  E10440: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15819  033222  033200                          R0440                   ;ERROR LOOP RETURN ADDRESS
15820
15821  033224  020403                  A0440:  CMP     R4,R3           ;CORRECT RESULT ?
15822  033226  001402                          BEQ     00440           ;BR IF YES
15823
15824  033230  104000                  E20440: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15825  033232  033200                          R0440                   ;ERROR LOOP RETURN ADDRESS
15826
15827  033234  000004                  00440:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15828                                   ; ***************************************************************************
15829                                          .SBTTL T0441 SUB TEST - SM1,DM0 - <N:C> = 1010
15830                                   ; ***************************************************************************
15831
15832                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15833
15834                                   ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8
15835
15836                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000
15837
15838                                   ;EXEC:          [370]ALUC=LLHHL :[360] D = 000000
15839
15840                                   ;CODES:         [360] SPS=3  /  N:C = 0100
15841
15842                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
15843
15844                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L
15845
15846  033236  012700  000441          T0441:  MOV     #0441,R0                ;LOAD R0 WITH TEST NO.
15847  033242  013701  033266                  MOV     @#I0441,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15848  033246  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
15849  033252  005004                          CLR     R4              ;RESULT S / B = 000000
15850  033254  012705  067614                  MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
15851  033260  011503                  R0441:  MOV     (R5),R3         ;[DEST] = 177777
15852  033262  000257                          CCC                     ;CLEAR FLAGS
15853  033264  000272                          272                     ;N:C = 1010
15854
15855  033266  161503                  I0441:  SUB     (R5),R3 ;TEST THE SUB
15856
15857  033270  100403                          BMI     E10441          ;N:C = 0100
15858  033272  001002                          BNE     E10441
15859  033274  102401                          BVS     E10441
15860  033276  103002                          BCC     A0441
15861
15862  033300  104005                  E10441: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15863  033302  033260                          R0441                   ;ERROR LOOP RETURN ADDRESS
15864
15865  033304  020403                  A0441:  CMP     R4,R3           ;CORRECT RESULT ?
15866  033306  001402                          BEQ     00441           ;BR IF YES
15867
15868  033310  104000                  E20441: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15869  033312  033260                          R0441                   ;ERROR LOOP RETURN ADDRESS
15870
15871  033314  000004                  00441:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15872                                   ; ***************************************************************************
15873                                           .SBTTL T0442 SUB TEST - SM1,DM0 - <N:C> = 0000
15874                                   ; ***************************************************************************
15875
15876                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15877
15878                                   ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8
15879
15880                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000
15881
15882                                   ;EXEC:          [370]ALUC=LLHHL :[360] D = 077777
15883
15884                                   ;CODES:         [360] SPS=3  /  N:C = 0010
15885
15886                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
15887
15888                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L
15889
15890  033316  012700  000442          T0442:  MOV     #0442,R0                ;LOAD R0 WITH TEST NO.
15891  033322  013701  033354                  MOV     @#I0442,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15892  033326  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15893  033332  012704  077777                  MOV     #77777,R4               ;RESULT S / B = 77777
15894  033336  012705  067606                  MOV     #MBUF1,R5               ;SRC ADDR =MBUF1
15895  033342  012703  100000          R0442:  MOV     #100000,R3      ;[DEST] = 100000
15896  033346  012715  000001                  MOV     #+1,(R5)        ;SRC OPR = +1
15897  033352  000257                          CCC                     ;CLEAR FLAGS
15898
15899  033354  161503          I0442:  SUB     (R5),R3         ;TEST THE SUB
15900
15901  033356  100403                  BMI     E10442          ;N:C = 0010
15902  033360  001402                  BEQ     E10442
15903  033362  102001                  BVC     E10442
15904  033364  103002                  BCC     A0442
15905
15906  033366  104005          E10442: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15907  033370  033342                  R0442                   ;ERROR LOOP RETURN ADDRESS
15908
15909  033372  020403          A0442:  CMP     R4,R3           ;CORRECT RESULT ?
15910  033374  001402                  BEQ     00442           ;BR IF YES
15911
15912  033376  104000          E20442: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15913  033400  033342                  R0442                   ;ERROR LOOP RETURN ADDRESS
15914
15915  033402  000004          00442:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
15916                                   ; ***************************************************************
15917                                          .SBTTL T0443 SUB  SM1.DM1 TEST - <N:C> = 0110
15918                                   ; ***************************************************************
15919
15920                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15921
15922                                   ;ROM SEQ:       [141,247,250,161,266,267,227,365,367,375,016] FC 1,2,3,8
15923
15924                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,227  /  16[367]016,016
15925
15926                                   ;EXEC:          [365]ALUC=LLHHL :[367]D=177777
15927
15928                                   ;CODES:         [367]SPS=3       /      N:C=1001
15929
15930                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
15931
15932                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CINOD L
15933
15934  033404  012700  000443          T0443:  MOV     #0443,R0                ;LOAD R0 WITH TEST NO.
15935  033410  013701  033444                  MOV     @#I0443,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15936  033414  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15937  033420  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
15938  033424  012705  067606                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
15939  033430  012715  000001          R0443:  MOV     #+1,(R5)        ;[SOURCE] = 000001
15940  033434  012712  000000                  MOV     #0,(R2)         ;[DEST] = 000000
15941  033440  000257                          CCC                     ;CLEAR FLAGS
15942  033442  000266                          266                     ;N:C = 0110
15943
15944  033444  161512          I0443:  SUB     (R5),(R2)       ;TEST THE SUB
15945
15946  033446  100003                  BPL     E10443          ;N:C = 1001 ?
15947  033450  001402                  BEQ     E10443
15948  033452  102401                  BVS     E10443
15949  033454  103402                  BCS     A0443
15950
15951  033456  104005          E10443: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
15952  033460  033430                  R0443                   ;ERROR LOOP RETURN ADDRESS
15953
15954  033462  020412          A0443:  CMP     R4,(R2)         ;CORRECT RESULT ?
15955  033464  001403                  BEQ     00443           ;BR IF YES
15956
15957  033466  011203                  MOV     (R2),R3         ;GET THE WAS DATA
15958  033470  104000          E20443: ERROR                   ;SUB DELIVERED THE WRONG RESULT
15959  033472  033430                  R0443                   ;ERROR LOOP RETURN ADDRESS
15960
15961  033474  000004          00443:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
15962                                   ; ***************************************************************************
15963                                          .SBTTL TO444 SUB  SM1,DM2 TEST - <N:C> = 0110
15964                                   ; ***************************************************************************
15965
15966                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
15967
15968                                   ;ROM SEQ:       [141,247,250,162,260,267,227,365,367,375,016] FC 1,2,3,8
15969
15970                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,162  /  33[260]220,227  /  16[367]016,016
15971
15972                                   ;EXEC:          [365]ALUC=LLHHL :[367]D=177777
15973
15974                                   ;CODES:         [367]SPS=3      /      N:C=1001
15975
15976                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
15977
15978                                   ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1 L  /  K3-3 DM=2  /  K3-8 CIN00 L
15979                                                   ;  K5-5 BCON(1+2) H
15980
15981  033476  012700  000444           TO444:  MOV     #0444,R0                ;LOAD R0 WITH TEST NO.
15982  033502  013701  033552                   MOV     @#I0444,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
15983  033506  032737  000400  066642           BIT     #400,@#BPTLOC   ;BREAKPOINT HALT SET ??
15984  033514  001401                           BEQ     .+4             ;BR IF NOT
15985  033516  000000                           HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
15986  033520  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
15987  033524  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
15988  033530  012705  067606                   MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
15989  033534  012715  000001           R0444:  MOV     #+1,(R5)        ;[SOURCE] = 000001
15990  033540  012712  000000                   MOV     #0,(R2)         ;[DEST] = 000000
15991  033544  010203                           MOV     R2,R3           ;R3 GETS DEST ADDR
15992  033546  000257                           CCC                     ;CLEAR FLAGS
15993  033550  000266                           266                     ;N:C = 0110
15994
15995  033552  161523           I0444:  SUB     (R5),(R3)+      ;TEST THE SUB
15996
15997  033554  100003                   BPL     E10444          ;N:C = 1001 ?
15998  033556  001402                   BEQ     E10444
15999  033560  102401                   BVS     E10444
16000  033562  103402                   BCS     A0444
16001
16002  033564  104005           E10444: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
16003  033566  033534                   R0444                   ;ERROR LOOP RETURN ADDRESS
16004
16005  033570  020412           A0444:  CMP     R4,(R2)         ;CORRECT RESULT ?
16006  033572  001403                   BEQ     00444           ;BR IF YES
16007
16008  033574  011203                   MOV     (R2),R3         ;GET THE WAS DATA
16009  033576  104000           E20444: ERROR                   ;SUB DELIVERED THE WRONG RESULT
16010  033600  033534                   R0444                   ;ERROR LOOP RETURN ADDRESS
16011
16012  033602  000004           00444:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
16013                                   ; ***************************************************************************
16014                                           .SBTTL T0445 NEG DM2 TEST
16015                                   ; ***************************************************************************
16016
16017                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16018
16019                                   ;ROM SEQ:       [162,260,267,221,367,375,016] FC 1,3,9,8
16020
16021                                   ;ACT BUTS:      37[004]100,162 / 33[260]220,221 / 16[367]016,016
16022
16023                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252
16024
16025                                   ;CODES:         [367] SPS=3  /  N:C = 1001
16026
16027                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
16028
16029                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=2L  /  K3-4 NEG L  /  K5-5 BCON(1+2)H
16030
16031  033604  012700  000445           T0445:  MOV     #0445,R0                ;LOAD R0 WITH THE TEST NO.
16032  033610  013701  033634                   MOV     @#I0445,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
16033  033614  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16034  033620  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
16035  033624  010205                   R0445:  MOV     R2,R5           ;[R5] = DEST ADDR
16036  033626  012712  052526                   MOV     #52526,(R2)     ;[DEST] = 52526
16037  033632  000257                           CCC                     ;SCOPE SYNC
16038
16039  033634  005425                   I0445:  NEG     (R5)+           ;TEST THE NEG - MODE 2
16040
16041  033636  020412                           CMP     R4,(R2)         ;RESULT = 125252?
16042  033640  001403                           BEQ     A0445           ;BR IF YES
16043
16044  033642  011203                           MOV     (R2),R3         ;GET THE WAS DATA
16045  033644  104000                   E10445: ERROR                   ;NEG DELIVERED WRONG RESULT
16046  033646  033624                           R0445                   ;ERROR LOOP RETURN
16047
16048  033650  022705  067604           A0445:  CMP     #MBUF0+2,R5     ;DID REG. GET AUTO INCREMENTED?
16049  033654  001402                           BEQ     00445           ;BR IF YES
16050
16051  033656  104005                   E20445: ERROR5                  ;NEG FAILED TO UPDATE REG.
16052  033660  033624                           R0445                   ;ERROR LOOP RETURN
16053
16054  033662  000004                   00445:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16055
```

```
16056                                   ; ***************************************************************************
16057                                          .SBTTL T0446 NEG DM3 TEST
16058                                   ; ***************************************************************************
16059
16060                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16061
16062                                   ;ROM SEQ:       [163,264,265,266,267,221,367,375,016] FC 1,3,9,8
16063
16064                                   ;ACT BUTS:      37[004]100,163 / 33[266]220,221 / 16[367]016,016
16065
16066                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252
16067
16068                                   ;CODES:         [367] SPS=3  /  N:C = 1001
16069
16070                                   ;SYNC:          BOSJ2 (-) T = 2.75 USEC
16071
16072                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=3L  /  K3-4 NEG L  /  K5-5 BCO1 H
16073
16074  033664  012700  000446           T0446:  MOV     #0446,R0                ;LOAD R0 WITH THE TEST NO.
16075  033670  013701  033716                   MOV     @#I0446,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
16076  033674  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16077  033700  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
16078  033704  012705  067576           R0446:  MOV     #ATA+10,R5      ;[ATA+10] = MBUF0
16079  033710  012712  052526                   MOV     #52526,(R2)     ;[DEST] = 52526
16080  033714  000257                           CCC                     ;SCOPE SYNC
16081
16082  033716  005435                   I0446:  NEG     @(R5)+          ;TEST THE NEG - MODE 3
16083
16084  033720  020412                           CMP     R4,(R2)         ;RESULT = 125252?
16085  033722  001403                           BEQ     A0446           ;BR IF YES
16086
16087  033724  011203                           MOV     (R2),R3         ;GET WAS DATA
16088  033726  104000                   E10446: ERROR                   ;NEG DELIVERED WRONG RESULT
16089  033730  033704                           R0446                   ;ERROR LOOP RETURN
16090
16091  033732  022705  067600           A0446:  CMP     #ATA+12,R5      ;DID REG GET AUTO INCREMENTED?
16092  033736  001402                           BEQ     00446           ;BR IF YES
16093
16094  033740  104005                   E20446: ERROR5                  ;NEG FAILED TO UPDATE REG.
16095  033742  033704                           R0446                   ;ERROR LOOP RETURN
16096
16097  033744  000004                   00446:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16098
```

```
16099                                   ; ***************************************************************************
16100                                           .SBTTL T0447 NEG DM4 TEST
16101                                   ; ***************************************************************************
16102
16103                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16104
16105                                   ;ROM SEQ:       [164,260,267,221,367,375,061] FC 1,3,9,8
16106
16107                                   ;ACT BUTS:      37[004]100,164 / 33[260]220,221 / 16[367]016,016
16108
16109                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252
16110
16111                                   ;CODES:         [367] SPS=3  /  N:C = 1001
16112
16113                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
16114
16115                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=4L  /  K3-4 NEG L  /  K5-5 BCON(1+2) H
16116
16117  033746  012700  000447           T0447:  MOV     #0447,R0                ;LOAD R0 WITH THE TEST NO.
16118  033752  013701  034000                   MOV     @#I0447,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
16119  033756  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16120  033762  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
16121  033766  012705  067604           R0447:  MOV     #MBUF0+2,R5     ;[R5] = DEST ADDR + 2
16122  033772  012712  052526                   MOV     #52526,(R2)     ;[DEST] = 52526
16123  033776  000257                           CCC                     ;SCOPE SYNC
16124
16125  034000  005445           I0447:  NEG     -(R5)           ;TEST THE NEG - MODE 4
16126
16127  034002  020412                   CMP     R4,(R2)         ;RESULT = 125252?
16128  034004  001403                   BEQ     A0447           ;BR IF YES
16129
16130  034006  011203                   MOV     (R2),R3         ;GET WAS DATA
16131  034010  104000           E10447: ERROR                   ;NEG DELIVERED WRONG RESULT
16132  034012  033766                   R0447                   ;ERROR LOOP RETURN
16133
16134  034014  020502           A0447:  CMP     R5,R2           ;DID REG GET AUTO INCREMENTED?
16135  034016  001402                   BEQ     O0447           ;BR IF YES
16136
16137  034020  104005           E20447: ERROR5                  ;NEG FAILED TO UPDATE REG
16138  034022  033766                   R0447                   ;ERROR LOOP RETURN
16139
16140  034024  000004           O0447:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16141
```

```
16142                                   ; ***************************************************************************
16143                                          .SBTTL T0450 NEG DM5 TEST
16144                                   ; ***************************************************************************
16145
16146                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16147
16148                                   ;ROM SEQ:       [165,264,265,266,267,221,367,375,016] FC 1,3,9,8
16149
16150                                   ;ACT BUTS:      37[004]100,165 / 33[266]220,221 / 16[367]016,016
16151
16152                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252
16153
16154                                   ;CODES:         [367] SPS=3  /  N:C = 1001
16155
16156                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
16157
16158                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=5L  /  K3-4 NEG L  /  K5-5 BCO1 H
16159
16160  034026  012700  000450           T0450:  MOV     #0450,R0                ;LOAD R0 WITH THE TEST NO.
16161  034032  013701  034060                   MOV     @#I0450,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
16162  034036  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16163  034042  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
16164  034046  012705  067600           R0450:  MOV     #ATA+12,R5      ;[R5] = (ADR OF MBUF0) +2
16165  034052  012712  052526                   MOV     #52526,(R2)     ;[DEST] = 52526
16166  034056  000257                           CCC                     ;SCOPE SYNC
16167
16168  034060  005455                   I0450:  NEG     @-(R5)          ;TEST THE NEG - MODE 5
16169
16170  034062  020412                           CMP     R4,(R2)         ;RESULT = 125252?
16171  034064  001403                           BEQ     A0450           ;BR IF YES
16172
16173  034066  011203                           MOV     (R2),R3         ;GET WAS DATA
16174  034070  104000                   E10450: ERROR                   ;NEG DELIVERED WRONG RESULT
16175  034072  034046                           R0450                   ;ERROR LOOP RETURN
16176
16177  034074  022705  067576           A0450:  CMP     #ATA+10,R5      ;DID NEG UPDATE REG
16178  034100  001402                           BEQ     00450           ;BR IF YES
16179
16180  034102  104005                   E20450: ERROR5                  ;NEG FAILED TO UPDATE REG
16181  034104  034046                           R0450                   ;ERROR LOOP RETURN
16182
16183  034106  000004                   00450:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16184
```

```
16185                                   ; ***************************************************************************
16186                                         .SBTTL T0451 NEG DM6 TEST
16187                                   ; ***************************************************************************
16188
16189                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16190
16191                                   ;ROM SEQ:       [166,261,262,266,267,221,367,375,016] FC 1,3,9,8
16192
16193                                   ;ACT BUTS:      37[004]100,166 / 33[266]220,221 / 16[367]016,016
16194
16195                                   ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252
16196
16197                                   ;CODES:         [367] SPS=3  /  N:C = 1001
16198
16199                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
16200
16201                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=6L  /  K3-4 NEG L  /  K5-5 BCO1 H
16202                                                   ;  K3-4 OVLAP CYCLE L
16203
16204  034110  012700  000451          T0451:  MOV     #0451,R0                ;LOAD R0 WITH THE TEST NO.
16205  034114  013701  034142                  MOV     @#I0451,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
16206  034120  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16207  034124  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
16208  034130  012705  067600          R0451:  MOV     #MBUF0-2,R5     ;[R5] = BASE ADDR
16209  034134  012712  052526                  MOV     #52526,(R2)     ;[DEST] = 52526
16210  034140  000257                          CCC                     ;SCOPE SYNC
16211
16212  034142  005465  000002          I0451:  NEG     2(R5)           ;TEST THE NEG - MODE 6
16213
16214  034146  020412                          CMP     R4,(R2)         ;RESULT = 125252?
16215  034150  001403                          BEQ     00451           ;BR IF YES
16216
16217  034152  011203                          MOV     (R2),R3         ;GET WAS DATA
16218  034154  104000                  E0451:  ERROR                   ;NEG DELIVERED WRONG RESULT
16219  034156  034130                          R0451                   ;ERROR LOOP RETURN
16220
16221  034160  000004                  00451:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16222
```

```
                                ; ************************************************************************
                                        .SBTTL T0452 NEG DM7 TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [166,261,263,264,265,266,267,221,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,166 / 33[266]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                ;CODES:         [367] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 3.5 USEC

                                ;KEY SIG:       K3-8 CINDO L  /  K3-3 DM=7L  /  K3-4 NEG L  /  K5-5 BCO1 H
                                ;  K3-4 OVLAP CYCLE L

034162  012700  000452        T0452:  MOV     #0452,R0                ;LOAD R0 WITH THE TEST NO.
034166  013701  034214                MOV     @#I0452,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
034172  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034176  012704  125252                MOV     #125252,R4      ;RESULT S / B = 125252
034202  012705  067566        R0452:  MOV     #ATA,R5         ;[R5] = BASE ADDR
034206  012712  052526                MOV     #52526,(R2)     ;[DEST] = 52526
034212  000257                        CCC                     ;SCOPE SYNC

034214  005475  000010        I0452:  NEG     @10(R5)         ;TEST THE NEG - MODE 7

034220  020412                        CMP     R4,(R2)         ;RESULT = 125252?
034222  001403                        BEQ     00452           ;BR IF YES

034224  011203                        MOV     (R2),R3         ;GET WAS DATA
034226  104000        E0452:  ERROR                           ;NEG DELIVERED WRONG RESULT
034230  034202                R0452                           ;ERROR LOOP RETURN

034232  000004        00452:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
16261                                   ; ************************************************************************
16262                                          .SBTTL T0453 MOV SM1,DM1 TEST - <N:C> = 0100
16263                                   ; ************************************************************************
16264
16265                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16266
16267                                   ;ROM SEQ:       [141,247,250,171,257,200,125,375,016] FC 1,2,4,8
16268
16269                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016
16270
16271                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16272
16273                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16274
16275                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16276
16277                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=1L  /  K3-3 MOV L
16278
16279  034234  012700  000453          T0453:  MOV     #0453,R0                ;LOAD R0 WITH TEST NO.
16280  034240  013701  034270                  MOV     @#I0453,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16281  034244  005004                          CLR     R4              ;RESULT S / B = 177777
16282  034246  005104                          COM     R4
16283  034250  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16284  034254  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16285  034260  010203                  R0453:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16286  034262  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
16287  034264  000257                          CCC                     ;CLEAR FLAGS
16288  034266  000264                          264                     ;N:C = 0100
16289
16290  034270  011513                  I0453:  MOV     (R5),(R3)       ;TEST THE MOV - SM1,DM1
16291
16292  034272  100003                          BPL     E10453          ;N:C = 1000 ?
16293  034274  001402                          BEQ     E10453
16294  034276  102401                          BVS     E10453
16295  034300  103002                          BCC     A0453
16296
16297  034302  104005                  E10453: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16298  034304  034260                          R0453                   ;ERROR LOOP RETURN
16299
16300  034306  020412                  A0453:  CMP     R4,(R2)         ;RESULT CORRECT ??
16301  034310  001404                          BEQ     00453           ;BR IF YES
16302
16303  034312  005003                          CLR     R3              ;GET THE WAS DATA
16304  034314  051203                          BIS     (R2),R3
16305  034316  104000                  E20453: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16306  034320  034260                          R0453                   ;ERROR LOOP RETURN
16307
16308  034322  000004                  00453:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16309
```

```
16310                                   ; ***************************************************************************
16311                                         .SBTTL T0454 MOV SM2,DM1 TEST - <N:C> = 0100
16312                                   ; ***************************************************************************
16313
16314                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16315
16316                                   ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4,8
16317
16318                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016
16319
16320                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16321
16322                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16323
16324                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16325
16326                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=1L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16327
16328  034324  012700  000454           T0454:  MOV     #0454,R0                ;LOAD R0 WITH TEST NO.
16329  034330  013701  034360                   MOV     @#I0454,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16330  034334  005004                           CLR     R4              ;RESULT S / B = 177777
16331  034336  005104                           COM     R4
16332  034340  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16333  034344  012705  067614                   MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16334  034350  010203                   R0454:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16335  034352  005012                           CLR     (R2)            ;MAKE [DEST] = 000000
16336  034354  000257                           CCC                     ;CLEAR FLAGS
16337  034356  000264                           264                     ;N:C = 0100
16338
16339  034360  012513                   I0454:  MOV     (R5)+,(R3)      ;TEST THE MOV - SM2,DM1
16340
16341  034362  100003                           BPL     E10454          ;N:C = 10CJ ?
16342  034364  001402                           BEQ     E10454
16343  034366  102401                           BVS     E10454
16344  034370  103002                           BCC     A0454
16345
16346  034372  104005                   E10454: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16347  034374  034350                           R0454                   ;ERROR LOOP RETURN
16348
16349  034376  020412                   A0454:  CMP     R4,(R2)         ;RESULT CORRECT ??
16350  034400  001404                           BEQ     00454           ;BR IF YES
16351
16352  034402  005003                           CLR     R3              ;GET THE WAS DATA
16353  034404  051203                           BIS     (R2),R3
16354  034406  104000                   E20454: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16355  034410  034350                           R0454                   ;ERROR LOOP RETURN
16356
16357  034412  000004                   00454:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
16358                                   ; ************************************************************************
16359                                         .SBTTL T0455 MOV SM1,DM1 TEST - <N:C> = 1011
16360                                   ; ************************************************************************
16361
16362                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16363
16364                                   ;ROM SEQ:       [142,247,250,171,257,200,125,375,016] FC 1,2,4,8
16365
16366                                   ;ACT BUTS:      37[004]100,142 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016
16367
16368                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
16369
16370                                   ;CODES:         [125] SPS=3  /  N:C = 0101
16371
16372                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16373
16374                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=1L  /  K3-3 MOV L
16375
16376  034414  012700  000455          T0455:  MOV     #0455,R0                ;LOAD R0 WITH TEST NO.
16377  034420  013701  034450                  MOV     @#I0455,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16378  034424  005004                          CLR     R4              ;RESULT S / B = 000000
16379  034426  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16380  034432  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16381  034436  010203                  R0455:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16382  034440  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
16383  034442  005112                          COM     (R2)
16384  034444  000257                          CCC                     ;CLEAR FLAGS
16385  034446  000273                          273                     ;N:C = 1011
16386
16387  034450  011513                  I0455:  MOV     (R5),(R3)       ;TEST THE MOV - SM1,DM1
16388
16389  034452  100403                          BMI     E10455          ;N:C = 0101 ?
16390  034454  001002                          BNE     E10455
16391  034456  102401                          BVS     E10455
16392  034460  103402                          BCS     A0455
16393
16394  034462  104005                  E10455: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16395  034464  034436                          R0455                   ;ERROR LOOP RETURN
16396
16397  034466  020412                  A0455:  CMP     R4,(R2)         ;RESULT CORRECT ??
16398  034470  001404                          BEQ     00455           ;BR IF YES
16399
16400  034472  005003                          CLR     R3              ;GET THE WAS DATA
16401  034474  051203                          BIS     (R2),R3
16402  034476  104000                  E20455: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16403  034500  034436                          R0455                   ;ERROR LOOP RETURN
16404
16405  034502  000004                  00455:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16406
```

```
16407                                   ; ***************************************************************************
16408                                           .SBTTL T0456 MOV SM2,DM1 TEST - <N:C> = 1011
16409                                   ; ***************************************************************************
16410
16411                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16412
16413                                   ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4,8
16414
16415                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016
16416
16417                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
16418
16419                                   ;CODES:         [125] SP=3  /  N:C = 0101
16420
16421                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16422
16423                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=1L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16424
16425  034504  012700  000456           T0456:  MOV     #0456,R0                ;LOAD R0 WITH TEST NO.
16426  034510  013701  034540                   MOV     @#I0456,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16427  034514  005004                           CLR     R4              ;RESULT S / B = 000000
16428  034516  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16429  034522  012705  067612                   MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16430  034526  010203                   R0456:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16431  034530  005012                           CLR     (R2)            ;MAKE [DEST] = 177777
16432  034532  005112                           COM     (R2)
16433  034534  000257                           CCC                     ;CLEAR FLAGS
16434  034536  000273                           273                     ;N:C = 1011
16435
16436  034540  012513                   I0456:  MOV     (R5)+,(R3)      ;TEST THE MOV - SM2,DM1
16437
16438  034542  100403                           BMI     E10456          ;N:C = 0101 ?
16439  034544  001002                           BNE     E10456
16440  034546  102401                           BVS     E10456
16441  034550  103402                           BCS     A0456
16442
16443  034552  104005                   E10456: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16444  034554  034526                           R0456                   ;ERROR LOOP RETURN
16445
16446  034556  020412                   A0456:  CMP     R4,(R2)         ;RESULT CORRECT ??
16447  034560  001404                           BEQ     00456           ;BR IF YES
16448
16449  034562  005003                           CLR     R3              ;GET THE WAS DATA
16450  034564  051203                           BIS     (R2),R3
16451  034566  104000                   E20456: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16452  034570  034526                           R0456                   ;ERROR LOOP RETURN
16453
16454  034572  000004                   00456:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16455
```

```
16456                                   ; ***************************************************************************
16457                                         .SBTTL T0457 MOV SM1,DM2 TEST - <N:C> = 0100
16458                                   ; ***************************************************************************
16459
16460                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16461
16462                                   ;ROM SEQ:       [141,247,250,172,257,200,125,375,016] FC 1,2,4,8
16463
16464                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,172 / 22[172]200,200 / 16[125]016,016
16465
16466                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16467
16468                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16469
16470                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16471
16472                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16473
16474  034574  012700  000457           T0457:  MOV     #0457,R0                ;LOAD R0 WITH TEST NO.
16475  034600  013701  034630                   MOV     @#I0457,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16476  034604  005004                           CLR     R4              ;RESULT S / B = 177777
16477  034606  005104                           COM     R4
16478  034610  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16479  034614  012705  067614                   MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA
16480  034620  010203                   R0457:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16481  034622  005012                           CLR     (R2)            ;MAKE [DEST] = 000000
16482  034624  000257                           CCC                     ;CLEAR FLAGS
16483  034626  000264                           264                     ;N:C = 0100
16484
16485  034630  011523                   I0457:  MOV     (R5),(R3)+      ;TEST THE MOV - SM1,DM2
16486
16487  034632  100003                           BPL     E10457          ;N:C =  1000 ?
16488  034634  001402                           BEQ     E10457
16489  034636  102401                           BVS     E10457
16490  034640  103002                           BCC     A0457
16491
16492  034642  104005                   E10457: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16493  034644  034620                           R0457                   ;ERROR LOOP RETURN
16494
16495  034646  022703  067604           A0457:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
16496  034652  001402                           BEQ     B0457           ;BR IF YES
16497
16498  034654  104005                   E20457: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16499  034656  034620                           R0457                   ;ERROR LOOP RETURN
16500
16501  034660  020412                   B0457:  CMP     R4,(R2)         ;RESULT CORRECT ??
16502  034662  001404                           BEQ     00457           ;BR IF YES
16503
16504  034664  005003                           CLR     R3              ;GET THE WAS DATA
16505  034666  051203                           BIS     (R2),R3
16506  034670  104000                   E30457: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16507  034672  034620                           R0457                   ;ERROR LOOP RETURN
16508
16509  034674  000004                   00457:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16510
```

```
16511                                   ; ***************************************************************************
16512                                          .SBTTL T0460 MOV SM2,DM2 TEST - <N:C> = 0100
16513                                   ; ***************************************************************************
16514
16515                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16516
16517                                   ;ROM SEQ:       [142,240,250,172,257,200,125,375,016] FC 1,2,4,8
16518
16519                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,172 / 22[172]200,200 / 16[125]016,016
16520
16521                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16522
16523                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16524
16525                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
16526
16527                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16528
16529  034676  012700  000460          T0460:  MOV     #0460,R0                ;LOAD R0 WITH TEST NO.
16530  034702  013701  034732                  MOV     @#I0460,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16531  034706  005004                          CLR     R4              ;RESULT S / B = 177777
16532  034710  005104                          COM     R4
16533  034712  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16534  034716  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA
16535  034722  010203          R0460:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16536  034724  005012                  CLR     (R2)            ;MAKE [DEST] = 000000
16537  034726  000257                  CCC                     ;CLEAR FLAGS
16538  034730  000264                  264                     ;N:C = 0100
16539
16540  034732  012523          I0460:  MOV     (R5)+,(R3)+     ;TEST THE MOV - SM2,DM2
16541
16542  034734  100003                  BPL     E10460          ;N:C = 1000 ?
16543  034736  001402                  BEQ     E10460
16544  034740  102401                  BVS     E10460
16545  034742  103002                  BCC     A0460
16546
16547  034744  104005          E10460: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16548  034746  034722                  R0460                   ;ERROR LOOP RETURN
16549
16550  034750  022703  067604  A0460:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
16551  034754  001402                  BEQ     B0460           ;BR IF YES
16552
16553  034756  104005          E20460: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16554  034760  034722                  R0460                   ;ERROR LOOP RETURN
16555
16556  034762  020412          B0460:  CMP     R4,(R2)         ;RESULT CORRECT ??
16557  034764  001404                  BEQ     00460           ;BR IF YES
16558
16559  034766  005003                  CLR     R3              ;GET THE WAS DATA
16560  034770  051203                  BIS     (R2),R3
16561  034772  104000          E30460: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16562  034774  034722                  R0460                   ;ERROR LOOP RETURN
16563
16564  034776  000004          00460:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16565
```

```
16566                                   ; ************************************************************************
16567                                          .SBTTL T0461 MOV SM1,DM2 TEST - <N:C> = 1011
16568                                   ; ************************************************************************
16569
16570                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16571
16572                                   ;ROM SEQ:       [141,247,250,172,257,200,125,375,016] FC 1,2,4,8
16573
16574                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,172 / 22[172]200,200 / 16[125]016,016
16575
16576                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
16577
16578                                   ;CODES:         [125] SPS=3  /  N:C = 0101
16579
16580                                   ;SYNC:          BOSJ2 (-) T = 3.25 USEC
16581
16582                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16583
16584  035000  012700  000461          T0461:  MOV     #0461,R0                ;LOAD R0 WITH TEST NO.
16585  035004  013701  035034                  MOV     @#I0461,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16586  035010  005004                          CLR     R4              ;RESULT S / B = 000000
16587  035012  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16588  035016  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16589  035022  010203                  R0461:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16590  035024  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
16591  035026  005112                          COM     (R2)
16592  035030  000257                          CCC                     ;CLEAR FLAGS
16593  035032  000273                          273                     ;N:C = 1011
16594
16595  035034  011523                  I0461:  MOV     (R5),(R3)+      ;TEST THE MOV - SM1,DM2
16596
16597  035036  100403                          BMI     E10461          ;N:C = 0101 ?
16598  035040  001002                          BNE     E10461
16599  035042  102401                          BVS     E10461
16600  035044  103402                          BCS     A0461
16601
16602  035046  104005                  E10461: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16603  035050  035022                          R0461                   ;ERROR LOOP RETURN
16604
16605  035052  022703  067604          A0461:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
16606  035056  001402                          BEQ     B0461           ;BR IF YES
16607
16608  035060  104005                  E20461: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16609  035062  035022                          R0461                   ;ERROR LOOP RETURN
16610
16611  035064  020412                  B0461:  CMP     R4,(R2)         ;RESULT CORRECT ??
16612  035066  001404                          BEQ     00461           ;BR IF YES
16613
16614  035070  005003                          CLR     R3              ;GET THE WAS DATA
16615  035072  051203                          BIS     (R2),R3
16616  035074  104000                  E30461: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16617  035076  035022                          R0461                   ;ERROR LOOP RETURN
16618
16619  035100  000004                  00461:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16620
```

```
16621                                   ; ***************************************************************************
16622                                          .SBTTL T0462 MOV SM2,DM2 TEST - <N:C> = 1011
16623                                   ; ***************************************************************************
16624
16625                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16626
16627                                   ;ROM SEQ:       [142,240,250,172,257,200,125,375,016] FC 1,2,4,8
16628
16629                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,172 / 22[172]200,200 / 16[125]016,016
16630
16631                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
16632
16633                                   ;CODES:         [125] SPS=3  /  N:C = 0101
16634
16635                                   ;SYNC:          BOSJ2 (-) T = 3.25 USEC
16636
16637                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16638
16639  035102  012700  000462          T0462:  MOV     #0462,R0                ;LOAD R0 WITH TEST NO.
16640  035106  013701  035136                  MOV     @#I0462,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16641  035112  005004                          CLR     R4              ;RESULT S / B = 000000
16642  035114  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16643  035120  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16644  035124  010203                  R0462:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
16645  035126  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
16646  035130  005112                          COM     (R2)
16647  035132  000257                          CCC                     ;CLEAR FLAGS
16648  035134  000273                          273                     ;N:C = 1011
16649
16650  035136  012523                  I0462:  MOV     (R5)+,(R3)+     ;TEST THE MOV - SM2,DM2
16651
16652  035140  100403                          BMI     E10462          ;N:C = 0101 ?
16653  035142  001002                          BNE     E10462
16654  035144  102401                          BVS     E10462
16655  035146  103402                          BCS     A0462
16656
16657  035150  104005                  E10462: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16658  035152  035124                          R0462                   ;ERROR LOOP RETURN
16659
16660  035154  022703  067604          A0462:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
16661  035160  001402                          BEQ     B0462           ;BR IF YES
16662
16663  035162  104005                  E20462: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16664  035164  035124                          R0462                   ;ERROR LOOP RETURN
16665
16666  035166  020412                  B0462:  CMP     R4,(R2)         ;RESULT CORRECT ??
16667  035170  001404                          BEQ     00462           ;BR IF YES
16668
16669  035172  005003                          CLR     R3              ;GET THE WAS DATA
16670  035174  051203                          BIS     (R2),R3
16671  035176  104000                  E30462: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16672  035200  035124                          R0462                   ;ERROR LOOP RETURN
16673
16674  035202  000004                  00462:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16675
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16676                                   ; ***************************************************************************
16677                                          .SBTTL T0463 MOV SM1,DM3 TEST - ‹N:C› = 0100
16678                                   ; ***************************************************************************
16679
16680                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16681
16682                                   ;ROM SEQ:       [141,247,250,173,207,2010,200,125,375,016] FC 1,2,4,8
16683
16684                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016
16685
16686                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16687
16688                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16689
16690                                   ;SYNC:          BOSJ2 (-) T = 4 USEC
16691
16692                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
16693
16694  035204  012700  000463          T0463:  MOV     #0463,R0                ;LOAD R0 WITH TEST NO.
16695  035210  013701  035242                  MOV     @#I0463,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16696  035214  005004                          CLR     R4              ;RESULT S / B = 177777
16697  035216  005104                          COM     R4
16698  035220  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16699  035224  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16700  035230  012703  067576          R0463:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
16701  035234  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
16702  035236  000257                          CCC                     ;CLEAR FLAGS
16703  035240  000264                          264                     ;N:C = 0100
16704
16705  035242  011533                  I0463:  MOV     (R5),@(R3)+     ;TEST THE MOV - SM1,DM3
16706
16707  035244  100003                          BPL     E10463          ;N:C = 1000 ?
16708  035246  001402                          BEQ     E10463
16709  035250  102401                          BVS     E10463
16710  035252  103002                          BCC     A0463
16711
16712  035254  104005                  E10463: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16713  035256  035230                          R0463                   ;ERROR LOOP RETURN
16714
16715  035260  022703  067600          A0463:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
16716  035264  001402                          BEQ     B0463           ;BR IF YES
16717
16718  035266  104005                  E20463: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16719  035270  035230                          R0463                   ;ERROR LOOP RETURN
16720
16721  035272  020412                  B0463:  CMP     R4,(R2)         ;RESULT CORRECT ??
16722  035274  001404                          BEQ     00463           ;BR IF YES
16723
16724  035276  005003                          CLR     R3              ;GET THE WAS DATA
16725  035300  051203                          BIS     (R2),R3
16726  035302  104000                  E30463: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16727  035304  035230                          R0463                   ;ERROR LOOP RETURN
16728
16729  035306  000004                  00463:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16730
```

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16731                                   ; ***************************************************************************
16732                                           .SBTTL T0464 MOV SM2,DM3 TEST - <N:C> = 0100
16733                                   ; ***************************************************************************
16734
16735                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16736
16737                                   ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8
16738
16739                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016
16740
16741                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16742
16743                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16744
16745                                   ;SYNC:          B05J2 (-) T = 4 USEC
16746
16747                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
16748                                                   ;  K5-5 BCON (1+2) H
16749
16750  035310  012700  000464       T0464:  MOV     #0464,R0                ;LOAD R0 WITH TEST NO.
16751  035314  013701  035346               MOV     @#I0464,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16752  035320  005004                       CLR     R4              ;RESULT S / B = 177777
16753  035322  005104                       COM     R4
16754  035324  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16755  035330  012705  067614               MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16756  035334  012703  067576       R0464:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
16757  035340  005012                       CLR     (R2)            ;MAKE [DEST] = 000000
16758  035342  000257                       CCC                     ;CLEAR FLAGS
16759  035344  000264                       264                     ;N:C = 0100
16760
16761  035346  012533               I0464:  MOV     (R5)+,@(R3)+    ;TEST THE MOV - SM2,DM3
16762
16763  035350  100003                       BPL     E10464          ;N:C = 1000 ?
16764  035352  001402                       BEQ     E10464
16765  035354  102401                       BVS     E10464
16766  035356  103002                       BCC     A0464
16767
16768  035360  104005               E10464: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16769  035362  035334                       R0464                   ;ERROR LOOP RETURN
16770
16771  035364  022703  067600       A0464:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
16772  035370  001402                       BEQ     B0464           ;BR IF YES
16773
16774  035372  104005               E20464: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16775  035374  035334                       R0464                   ;ERROR LOOP RETURN
16776
16777  035376  020412               B0464:  CMP     R4,(R2)         ;RESULT CORRECT ??
16778  035400  001404                       BEQ     00464           ;BR IF YES
16779
16780  035402  005003                       CLR     R3              ;GET THE WAS DATA
16781  035404  051203                       BIS     (R2),R3
16782  035406  104000               E30464: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16783  035410  035334                       R0464                   ;ERROR LOOP RETURN
16784
16785  035412  000004               00464:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16786
```

```
16787                                   ; ***************************************************************************
16788                                           .SBTTL T0465 MOV SM1,DM3 TEST - <N:C> = 1011
16789                                   ; ***************************************************************************
16790
16791                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16792
16793                                   ;ROM SEQ:       [141,247,250,173,207,210,200,125,375,016] FC 1,2,4,8
16794
16795                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016
16796
16797                                   ;EXEC:          [200]ALUC-LLLLL :[125] D = 000000
16798
16799                                   ;CODES:         [125] SPS=3  /  N:C = 0101
16800
16801                                   ;SYNC:          B05J2 (-) T = 4 USEC
16802
16803                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
16804
16805  035414  012700  000465          T0465:  MOV     #0465,R0                ;LOAD R0 WITH TEST NO.
16806  035420  013701  035452                  MOV     @#I0465,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16807  035424  005004                          CLR     R4              ;RESULT S / B = 000000
16808  035426  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16809  035432  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16810  035436  012703  067576          R0465:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
16811  035442  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
16812  035444  005112                          COM     (R2)
16813  035446  000257                          CCC                     ;CLEAR FLAGS
16814  035450  000273                          273                     ;N:C = 1011
16815
16816  035452  011533          I0465:  MOV     (R5),@(R3)+     ;TEST THE MOV - SM1,DM3
16817
16818  035454  100403                          BMI     E10465          ;N:C = 0101 ?
16819  035456  001002                          BNE     E10465
16820  035460  102401                          BVS     E10465
16821  035462  103402                          BCS     A0465
16822
16823  035464  104005          E10465: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16824  035466  035436                  R0465                   ;ERROR LOOP RETURN
16825
16826  035470  022703  067600  A0465:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
16827  035474  001402                          BEQ     B0465           ;BR IF YES
16828
16829  035476  104005          E20465: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16830  035500  035436                  R0465                   ;ERROR LOOP RETURN
16831
16832  035502  020412          B0465:  CMP     R4,(R2)         ;RESULT CORRECT ??
16833  035504  001404                          BEQ     00465           ;BR IF YES
16834
16835  035506  005003                          CLR     R3              ;GET THE WAS DATA
16836  035510  051203                          BIS     (R2),R3
16837  035512  104000          E30465: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16838  035514  035436                  R0465                   ;ERROR LOOP RETURN
16839
16840  035516  000004          00465:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16841
```

```
16842                                   ; ***************************************************************************
16843                                          .SBTTL T0466 MOV SM2,DM3 TEST - <N:C> = 1011
16844                                   ; ***************************************************************************
16845
16846                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16847
16848                                   ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8
16849
16850                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016
16851
16852                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
16853
16854                                   ;CODES:         [125] SPS=3  /  N:C = 0101
16855
16856                                   ;SYNC:          B05J2 (-) T = 4 USEC
16857
16858                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
16859                                                   ;  K5-5 BCON (1+2) H
16860
16861  035520  012700  000466       T0466:  MOV     #0466,R0            ;LOAD R0 WITH TEST NO.
16862  035524  013701  035556               MOV     @#I0466,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16863  035530  005004                       CLR     R4              ;RESULT S / B = 000000
16864  035532  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16865  035536  012705  067612               MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
16866  035542  012703  067576       R0466:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
16867  035546  005012                       CLR     (R2)            ;MAKE [DEST] = 177777
16868  035550  005112                       COM     (R2)
16869  035552  000257                       CCC                     ;CLEAR FLAGS
16870  035554  000273                       273                     ;N:C = 1011
16871
16872  035556  012533               I0466:  MOV     (R5)+,@(R3)+    ;TEST THE MOV - SM2,DM3
16873
16874  035560  100403                       BMI     E10466          ;N:C = 0101 ?
16875  035562  001002                       BNE     E10466
16876  035564  102401                       BVS     E10466
16877  035566  103402                       BCS     A0466
16878
16879  035570  104005               E10466: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16880  035572  035542                       R0466                   ;ERROR LOOP RETURN
16881
16882  035574  022703  067600       A0466:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
16883  035600  001402                       BEQ     B0466           ;BR IF YES
16884
16885  035602  104005               E20466: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16886  035604  035542                       R0466                   ;ERROR LOOP RETURN
16887
16888  035606  020412               B0466:  CMP     R4,(R2)         ;RESULT CORRECT ??
16889  035610  001404                       BEQ     00466           ;BR IF YES
16890
16891  035612  005003                       CLR     R3              ;GET THE WAS DATA
16892  035614  051203                       BIS     (R2),R3
16893  035616  104000               E30466: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16894  035620  035542                       R0466                   ;ERROR LOOP RETURN
16895
16896  035622  000004               00466:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16897
```

```
16898                                   ; ***************************************************************************
16899                                          .SBTTL T0467 MOV SM1,DM4 TEST - <N:C> = 0100
16900                                   ; ***************************************************************************
16901
16902                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16903
16904                                   ;ROM SEQ:       [141,247,250,174,257,200,125,375,016] FC 1,2,4,8
16905
16906                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016
16907
16908                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16909
16910                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16911
16912                                   ;SYNC:          BOSJ2 (-) T = 3.2 USEC
16913
16914                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16915
16916  035624  012700  000467          T0467:  MOV     #0467,R0                ;LOAD R0 WITH TEST NO.
16917  035630  013701  035662                  MOV     @#I0467,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16918  035634  005004                          CLR     R4              ;RESULT S / B = 177777
16919  035636  005104                          COM     R4
16920  035640  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16921  035644  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16922  035650  012703  067604          R0467:  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
16923  035654  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
16924  035656  000257                          CCC                     ;CLEAR FLAGS
16925  035660  000264                          264                     ;N:C = 0100
16926
16927  035662  011543          I0467:  MOV     (R5),-(R3)      ;TEST THE MOV - SM1,DM4
16928
16929  035664  100003                          BPL     E10467          ;N:C = 1000 ?
16930  035666  001402                          BEQ     E10467
16931  035670  102401                          BVS     E10467
16932  035672  103002                          BCC     A0467
16933
16934  035674  104005          E10467: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16935  035676  035650                  R0467                   ;ERROR LOOP RETURN
16936
16937  035700  020203          A0467:  CMP     R2,R3           ;DID MOV DECREMENT DEST REG ?
16938  035702  001402                  BEQ     B0467           ;BR IF YES
16939
16940  035704  104005          E20467: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16941  035706  035650                  R0467                   ;ERROR LOOP RETURN
16942
16943  035710  020412          B0467:  CMP     R4,(R2)         ;RESULT CORRECT ??
16944  035712  001404                  BEQ     00467           ;BR IF YES
16945
16946  035714  005003                  CLR     R3              ;GET THE WAS DATA
16947  035716  051203                  BIS     (R2),R3
16948  035720  104000          E30467: ERROR                   ;MOV DELIVERED THE WRONG RESULT
16949  035722  035650                  R0467                   ;ERROR LOOP RETURN
16950
16951  035724  000004          00467:  SCOPE                   ;CALL SCOPE LOOP UTILITY
16952
```

```
16953                                   ; ************************************************************************
16954                                           .SBTTL T0470 MOV SM2,DM4 TEST - <N:C> = 0100
16955                                   ; ************************************************************************
16956
16957                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
16958
16959                                   ;ROM SEQ:       [142,240,250,174,257,200,125,375,016] FC 1,2,4,8
16960
16961                                   ;ACT BUTS:      37[004]100,142 / 35[240]140,174 / 22[174]200,200 / 16[125]016,016
16962
16963                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
16964
16965                                   ;CODES:         [125] SPS=3  /  N:C = 1000
16966
16967                                   ;SYNC:          BOSJ2 (-) T = 3.2 USEC
16968
16969                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
16970
16971  035726  012700  000470          T0470:  MOV     #0470,R0                ;LOAD R0 WITH TEST NO.
16972  035732  013701  035764                  MOV     @#I0470,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
16973  035736  005004                          CLR     R4              ;RESULT S / B = 177777
16974  035740  005104                          COM     R4
16975  035742  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
16976  035746  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
16977  035752  012703  067604          R0470:  MOV     #MBUF0+2,R3             ;BASE DEST ADDR = MBUF0+2
16978  035756  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
16979  035760  000257                          CCC                     ;CLEAR FLAGS
16980  035762  000264                          264                     ;N:C = 0100
16981
16982  035764  012543          I0470:  MOV     (R5)+,-(R3)     ;TEST THE MOV - SM2,DM4
16983
16984  035766  100003                          BPL     E10470          ;N:C = 1000 ?
16985  035770  001402                          BEQ     E10470
16986  035772  102401                          BVS     E10470
16987  035774  103002                          BCC     A0470
16988
16989  035776  104005          E10470: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
16990  036000  035752                  R0470                   ;ERROR LOOP RETURN
16991
16992  036002  020203          A0470:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
16993  036004  001402                  BEQ     B0470           ;BR IF YES
16994
16995  036006  104005          E20470: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
16996  036010  035752                  R0470                   ;ERROR LOOP RETURN
16997
16998  036012  020412          B0470:  CMP     R4,(R2)         ;RESULT CORRECT ??
16999  036014  001404                  BEQ     00470           ;BR IF YES
17000
17001  036016  005003                  CLR     R3              ;GET THE WAS DATA
17002  036020  051203                  BIS     (R2),R3
17003  036022  104000          E30470: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17004  036024  035752                  R0470                   ;ERROR LOOP RETURN
17005
17006  036026  000004          00470:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17007
```

```
17008                                   ; ***************************************************************************
17009                                          .SBTTL T0471 MOV SM1,DM4 TEST - <N:C> = 1011
17010                                   ; ***************************************************************************
17011
17012                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17013
17014                                   ;ROM SEQ:       [141,247,250,174,257,200,125,375,016] FC 1,2,4,8
17015
17016                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016
17017
17018                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17019
17020                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17021
17022                                   ;SYNC:          BO5J2 (-) T = 3.2 USEC
17023
17024                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17025
17026  036030  012700  000471           T0471:  MOV     #0471,R0                ;LOAD R0 WITH TEST NO.
17027  036034  013701  036066                   MOV     @#I0471,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17028  036040  005004                           CLR     R4              ;RESULT S / B = 000000
17029  036042  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17030  036046  012705  067612                   MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17031  036052  012703  067604           R0471:  MOV     #MBUF0+2,R3             ;BASE DEST ADDR = MBUF0+2
17032  036056  005012                           CLR     (R2)            ;MAKE [DEST] = 177777
17033  036060  005112                           COM     (R2)
17034  036062  000257                           CCC                     ;CLEAR FLAGS
17035  036064  000273                           273                     ;N:C = 1011
17036
17037  036066  011543           I0471:  MOV     (R5),-(R3)      ;TEST THE MOV - SM1,DM4
17038
17039  036070  100403                   BMI     E10471          ;N:C = 0101 ?
17040  036072  001002                   BNE     E10471
17041  036074  102401                   BVS     E10471
17042  036076  103402                   BCS     A0471
17043
17044  036100  104005           E10471: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17045  036102  036052                   R0471                   ;ERROR LOOP RETURN
17046
17047  036104  020203           A0471:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
17048  036106  001402                   BEQ     B0471           ;BR IF YES
17049
17050  036110  104005           E20471: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17051  036112  036052                   R0471                   ;ERROR LOOP RETURN
17052
17053  036114  020412           B0471:  CMP     R4,(R2)         ;RESULT CORRECT ??
17054  036116  001404                   BEQ     00471           ;BR IF YES
17055
17056  036120  005003                   CLR     R3              ;GET THE WAS DATA
17057  036122  051203                   BIS     (R2),R3
17058  036124  104000           E30471: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17059  036126  036052                   R0471                   ;ERROR LOOP RETURN
17060
17061  036130  000004           00471:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17062
```

```
17063                                   ; ***************************************************************************
17064                                          .SBTTL T0472 MOV SM2,DM4 TEST - <N:C> = 1011
17065                                   ; ***************************************************************************
17066
17067                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17068
17069                                   ;ROM SEQ:       [142,240,250,174,257,200,125,375,016] FC 1,2,4,8
17070
17071                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 16[125]016,016
17072
17073                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17074
17075                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17076
17077                                   ;SYNC:          BOSJ2 (-) T = 3.2 USEC
17078
17079                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17080
17081  036132  012700  000472          T0472:  MOV     #0472,R0                ;LOAD R0 WITH TEST NO.
17082  036136  013701  036170                  MOV     @#I0472,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17083  036142  005004                          CLR     R4              ;RESULT S / B = 000000
17084  036144  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17085  036150  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17086  036154  012703  067604          R0472:  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
17087  036160  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17088  036162  005112                          COM     (R2)
17089  036164  000257                          CCC                     ;CLEAR FLAGS
17090  036166  000273                          273                     ;N:C = 1011
17091
17092  036170  012543          I0472:  MOV     (R5)+,-(R3)     ;TEST THE MOV - SM2,DM4
17093
17094  036172  100403                          BMI     E10472          ;N:C = 0101 ?
17095  036174  001002                          BNE     E10472
17096  036176  102401                          BVS     E10472
17097  036200  103402                          BCS     A0472
17098
17099  036202  104005          E10472: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17100  036204  036154                  R0472                   ;ERROR LOOP RETURN
17101
17102  036206  020203          A0472:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
17103  036210  001402                  BEQ     B0472           ;BR IF YES
17104
17105  036212  104005          E20472: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17106  036214  036154                  R0472                   ;ERROR LOOP RETURN
17107
17108  036216  020412          B0472:  CMP     R4,(R2)         ;RESULT CORRECT ??
17109  036220  001404                  BEQ     00472           ;BR IF YES
17110
17111  036222  005003                  CLR     R3              ;GET THE WAS DATA
17112  036224  051203                  BIS     (R2),R3
17113  036226  104000          E30472: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17114  036230  036154                  R0472                   ;ERROR LOOP RETURN
17115
17116  036232  000004          00472:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17117
```

```
17118                                   ; ***************************************************************************
17119                                          .SBTTL T0473 MOV SM1,DM5 TEST - <N:C> = 0100
17120                                   ; ***************************************************************************
17121
17122                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17123
17124                                   ;ROM SEQ:       [141,247,250,175,207,210,200,125,375,016] FC 1,2,4,8
17125
17126                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,175 / 22[207]200,200 / 16[125]016,016
17127
17128                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17129
17130                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17131
17132                                   ;SYNC:          B05J2 (-) T = 4 USEC
17133
17134                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H
17135
17136  036234  012700  000473          T0473:  MOV     #0473,R0                ;LOAD R0 WITH TEST NO.
17137  036240  013701  036272                  MOV     @#I0473,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17138  036244  005004                          CLR     R4              ;RESULT S / B = 177777
17139  036246  005104                          COM     R4
17140  036250  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17141  036254  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17142  036260  012703  067600          R0473:  MOV     #ATA+12,R3                      ;BASE DEST ADDR = ATA+12
17143  036264  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
17144  036266  000257                          CCC                     ;CLEAR FLAGS
17145  036270  000264                          264                     ;N:C = 0100
17146
17147  036272  011553                  I0473:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM1,DM5
17148
17149  036274  100003                          BPL     E10473          ;N:C = 0100 ?
17150  036276  001402                          BEQ     E10473
17151  036300  102401                          BVS     E10473
17152  036302  103002                          BCC     A0473
17153
17154  036304  104005                  E10473: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17155  036306  036260                          R0473                   ;ERROR LOOP RETURN
17156
17157  036310  022703  067576          A0473:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
17158  036314  001402                          BEQ     B0473           ;BR IF YES
17159
17160  036316  104005                  E20473: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17161  036320  036260                          R0473                   ;ERROR LOOP RETURN
17162
17163  036322  020412                  B0473:  CMP     R4,(R2)         ;RESULT CORRECT ??
17164  036324  001404                          BEQ     00473           ;BR IF YES
17165
17166  036326  005003                          CLR     R3              ;GET THE WAS DATA
17167  036330  051203                          BIS     (R2),R3
17168  036332  104000                  E30473: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17169  036334  036260                          R0473                   ;ERROR LOOP RETURN
17170
17171  036336  000004                  00473:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17172
```

```
17173                                   ; ************************************************************************
17174                                           .SBTTL T0474 MOV SM2,DM5 TEST - <N:C> = 0100
17175                                   ; ************************************************************************
17176
17177                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17178
17179                                   ;ROM SEQ:       [142,240,250,175,207,210,200,125,375,016] FC 1,2,4,8
17180
17181                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,175 / 22[207]200,200 / 16[125]016,016
17182
17183                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17184
17185                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17186
17187                                   ;SYNC:          BOSJ2 (-) T = 4 USEC
17188
17189                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H
17190                                                   ;  K5-5 BCON (1+2) H
17191
17192  036340  012700  000474          T0474:  MOV     #0474,R0                ;LOAD R0 WITH TEST NO.
17193  036344  013701  036376                  MOV     @#I0474,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17194  036350  005004                          CLR     R4              ;RESULT S / B = 177777
17195  036352  005104                          COM     R4
17196  036354  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17197  036360  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17198  036364  012703  067600          R0474:  MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
17199  036370  005012                          CLR     (R2)            ;MAKE [DEST] = 00000
17200  036372  000257                          CCC                     ;CLEAR FLAGS
17201  036374  000264                          264                     ;N:C = 1000
17202
17203  036376  012553          I0474:  MOV     (R5)+,@-(R3)    ;TEST THE MOV - SM2,DM5
17204
17205  036400  100003                          BPL     E10474          ;N:C = 1000 ?
17206  036402  001402                          BEQ     E10474
17207  036404  102401                          BVS     E10474
17208  036406  103002                          BCC     A0474
17209
17210  036410  104005          E10474: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17211  036412  036364                  R0474                   ;ERROR LOOP RETURN
17212
17213  036414  022703  067576          A0474:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
17214  036420  001402                          BEQ     B0474           ;BR IF YES
17215
17216  036422  104005          E20474: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17217  036424  036364                  R0474                   ;ERROR LOOP RETURN
17218
17219  036426  020412          B0474:  CMP     R4,(R2)         ;RESULT CORRECT ??
17220  036430  001404                          BEQ     00474           ;BR IF YES
17221
17222  036432  005003                          CLR     R3              ;GET THE WAS DATA
17223  036434  051203                          BIS     (R2),R3
17224  036436  104000          E30474: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17225  036440  036364                  R0474                   ;ERROR LOOP RETURN
17226
17227  036442  000004          00474:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17228
```

```
17229                                   ; ***************************************************************************
17230                                           .SBTTL T0475 MOV SM1,DM5 TEST - <N:C> = 1011
17231                                   ; ***************************************************************************
17232
17233                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17234
17235                                   ;ROM SEQ:       [141,247,250,175,207,210,200,125,375,016] FC 1,2,4,8
17236
17237                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,175 / 22[207]200,200 / 16[125]016,016
17238
17239                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17240
17241                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17242
17243                                   ;SYNC:          B05J2 (-) T = 4 USEC
17244
17245                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H
17246
17247  036444  012700  000475           T0475:  MOV     #0475,R0                ;LOAD R0 WITH TEST NO.
17248  036450  013701  036502                   MOV     @#I0475,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17249  036454  005004                           CLR     R4              ;RESULT S / B = 000000
17250  036456  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17251  036462  012705  067612                   MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17252  036466  012703  067600           R0475:  MOV     #ATA+12,R3              ;BASE DEST ADDR = ATA+12
17253  036472  005012                           CLR     (R2)            ;MAKE [DEST] = 177777
17254  036474  005112                           COM     (R2)
17255  036476  000257                           CCC                     ;CLEAR FLAGS
17256  036500  000273                           273                     ;N:C = 1011
17257
17258  036502  011553           I0475:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM1,DM5
17259
17260  036504  100403                           BMI     E10475          ;N:C = 0101 ?
17261  036506  001002                           BNE     E10475
17262  036510  102401                           BVS     E10475
17263  036512  103402                           BCS     A0475
17264
17265  036514  104005           E10475: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17266  036516  036466                           R0475           ;ERROR LOOP RETURN
17267
17268  036520  022703  067576   A0475:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
17269  036524  001402                           BEQ     B0475           ;BR IF YES
17270
17271  036526  104005           E20475: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17272  036530  036466                           R0475           ;ERROR LOOP RETURN
17273
17274  036532  020412           B0475:  CMP     R4,(R2)         ;RESULT CORRECT ??
17275  036534  001404                           BEQ     00475           ;BR IF YES
17276
17277  036536  005003                           CLR     R3              ;GET THE WAS DATA
17278  036540  051203                           BIS     (R2),R3
17279  036542  104000           E30475: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17280  036544  036466                           R0475           ;ERROR LOOP RETURN
17281
17282  036546  000004           00475:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17283
```

```
17284                                   ; ***************************************************************************
17285                                           .SBTTL T0476 MOV SM2,DM5 TEST - <N:C> = 1011
17286                                   ; ***************************************************************************
17287
17288                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17289
17290                                   ;ROM SEQ:       [142,240,250,175,207,210,200,125,375,016] FC 1,2,4,8
17291
17292                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,175 / 22[207]200,200 / 16[125]016,016
17293
17294                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17295
17296                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17297
17298                                   ;SYNC:          BOSJ2 (-) T = 4 USEC
17299
17300                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BCO1 H
17301                                                   ;  K5-5 BCON (1+2) H
17302
17303  036550  012700  000476          T0476:  MOV     #0476,R0            ;LOAD R0 WITH TEST NO.
17304  036554  013701  036606                  MOV     @#I0476,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17305  036560  005004                          CLR     R4              ;RESULT S / B = 000000
17306  036562  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17307  036566  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17308  036572  012703  067600          R0476:  MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
17309  036576  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17310  036600  005112                          COM     (R2)
17311  036602  000257                          CCC                     ;CLEAR FLAGS
17312  036604  000273                          273                     ;N:C = 1011
17313
17314  036606  011553                  I0476:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM2,DM5
17315
17316  036610  100403                          BMI     E10476          ;N:C = 0101 ?
17317  036612  001002                          BNE     E10476
17318  036614  102401                          BVS     E10476
17319  036616  103402                          BCS     A0476
17320
17321  036620  104005                  E10476: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17322  036622  036572                          R0476                   ;ERROR LOOP RETURN
17323
17324  036624  022703  067576          A0476:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
17325  036630  001402                          BEQ     B0476           ;BR IF YES
17326
17327  036632  104005                  E20476: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
17328  036634  036572                          R0476                   ;ERROR LOOP RETURN
17329
17330  036636  020412                  B0476:  CMP     R4,(R2)         ;RESULT CORRECT ??
17331  036640  001404                          BEQ     00476           ;BR IF YES
17332
17333  036642  005003                          CLR     R3              ;GET THE WAS DATA
17334  036644  051203                          BIS     (R2),R3
17335  036646  104000                  E30476: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17336  036650  036572                          R0476                   ;ERROR LOOP RETURN
17337
17338  036652  000004                  00476:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17339
```

```
17340                                   ; ***************************************************************************
17341                                           .SBTTL T0477 MOV SM1,DM6 TEST - <N:C> = 0100
17342                                   ; ***************************************************************************
17343
17344                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17345
17346                                   ;ROM SEQ:       [141,247,250,177,206,212,200,125,375,016] FC 1,2,4,8
17347
17348                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,212 / 21[206]200,200
17349                                                   ; / 16[125]016,016
17350
17351                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17352
17353                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17354
17355                                   ;SYNC:          B05J2 (-) T = 4 USEC
17356
17357                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L K3-3 MOV L
17358
17359  036654  012700  000477          T0477:  MOV     #0477,R0                ;LOAD R0 WITH TEST NO.
17360  036660  013701  036712                  MOV     @#I0477,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17361  036664  005004                          CLR     R4              ;RESULT S / B = 177777
17362  036666  005104                          COM     R4
17363  036670  012702  067610                  MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
17364  036674  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17365  036700  012703  067602          R0477:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
17366  036704  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
17367  036706  000257                          CCC                     ;CLEAR FLAGS
17368  036710  000264                          264                     ;N:C = 0100
17369
17370  036712  011563  000006          I0477:  MOV     (R5),6(R3)      ;TEST THE MOV - SM1,DM6
17371
17372  036716  100003                          BPL     E10477          ;N:C = 1000 ?
17373  036720  001402                          BEQ     E10477
17374  036722  102401                          BVS     E10477
17375  036724  103002                          BCC     A0477
17376
17377  036726  104005          E10477: ERROR5                          ;MOV FAILED TO ALTER CODES PROPERLY
17378  036730  036700                  R0477                           ;ERROR LOOP RETURN
17379
17380  036732  020412          A0477:  CMP     R4,(R2)         ;RESULT CORRECT ??
17381  036734  001404                  BEQ     00477           ;BR IF YES
17382
17383  036736  005003                  CLR     R3              ;GET THE WAS DATA
17384  036740  051203                  BIS     (R2),R3
17385  036742  104000          E20477: ERROR                           ;MOV DELIVERED THE WRONG RESULT
17386  036744  036700                  R0477                           ;ERROR LOOP RETURN
17387
17388  036746  000004          00477:  SCOPE                           ;CALL SCOPE LOOP UTILITY
17389
```

```
17390                                   ; ************************************************************************
17391                                          .SBTTL T0500 MOV SM2,DM6 TEST - <N:C> = 0100
17392                                   ; ************************************************************************
17393
17394                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17395
17396                                   ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8
17397
17398                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
17399                                                   ; / 16[125]016,016
17400
17401                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17402
17403                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17404
17405                                   ;SYNC:          B05J2 (-) T = 4 USEC
17406
17407                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17408
17409  036750  012700  000500        T0500:  MOV     #0500,R0                ;LOAD R0 WITH TEST NO.
17410  036754  013701  037006                MOV     @#I0500,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17411  036760  005004                        CLR     R4              ;RESULT S / B = 177777
17412  036762  005104                        COM     R4
17413  036764  012702  067610                MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
17414  036770  012705  067614                MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17415  036774  012703  067602        R0500:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
17416  037000  005012                        CLR     (R2)            ;MAKE [DEST] = 000000
17417  037002  000257                        CCC                     ;CLEAR FLAGS
17418  037004  000264                        264                     ;N:C = 0100
17419
17420  037006  012563  000006        I0500:  MOV     (R5)+,6(R3)     ;TEST THE MOV - SM2,DM6
17421
17422  037012  100003                        BPL     E10500          ;N:C = 1000 ?
17423  037014  001402                        BEQ     E10500
17424  037016  102401                        BVS     E10500
17425  037020  103002                        BCC     A0500
17426
17427  037022  104005        E10500: ERROR5                          ;MOV FAILED TO ALTER CODES PROPERLY
17428  037024  036774                R0500                           ;ERROR LOOP RETURN
17429
17430  037026  020412        A0500:  CMP     R4,(R2)         ;RESULT CORRECT ??
17431  037030  001404                BEQ     00500           ;BR IF YES
17432
17433  037032  005003                CLR     R3              ;GET THE WAS DATA
17434  037034  051203                BIS     (R2),R3
17435  037036  104000        E20500: ERROR                           ;MOV DELIVERED THE WRONG RESULT
17436  037040  036774                R0500                           ;ERROR LOOP RETURN
17437
17438  037042  000004        00500:  SCOPE                           ;CALL SCOPE LOOP UTILITY
17439
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```
17440                                   ; ***************************************************************************
17441                                          .SBTTL T0501 MOV SM1,DM6 TEST - <N:C> = 1011
17442                                   ; ***************************************************************************
17443
17444                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17445
17446                                   ;ROM SEQ:       [141,247,250,177,206,212,200,125,375,016] FC 1,2,4,8
17447
17448                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,212 / 21[206]200,200
17449                                   ; / 16[125]016,016
17450
17451                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17452
17453                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17454
17455                                   ;SYNC:          B05J2 (-) T = 4 USEC
17456
17457                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L  /  K3-3 MOV L
17458
17459  037044  012700  000501          T0501:  MOV     #0501,R0                ;LOAD R0 WITH TEST NO.
17460  037050  013701  037102                  MOV     @#I0501,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17461  037054  005004                          CLR     R4              ;RESULT S / B = 000000
17462  037056  012702  067610                  MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
17463  037062  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17464  037066  012703  067602          R0501:  MOV     #MBUF0,R3               ;BASE DEST ADDR = MBUF0
17465  037072  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17466  037074  005112                          COM     (R2)
17467  037076  000257                          CCC                     ;CLEAR FLAGS
17468  037100  000273                          273                     ;N:C = 1011
17469
17470  037102  011563  000006          I0501:  MOV     (R5),6(R3)      ;TEST THE MOV - SM1,DM6
17471
17472  037106  100403                          BMI     E10501          ;N:C = 0101 ?
17473  037110  001002                          BNE     E10501
17474  037112  102401                          BVS     E10501
17475  037114  103402                          BCS     A0501
17476
17477  037116  104005          E10501: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17478  037120  037066                  R0501                   ;ERROR LOOP RETURN
17479
17480  037122  020412          A0501:  CMP     R4,(R2)         ;RESULT CORRECT ??
17481  037124  001404                  BEQ     00501           ;BR IF YES
17482
17483  037126  005003                  CLR     R3              ;GET THE WAS DATA
17484  037130  051203                  BIS     (R2),R3
17485  037132  104000          E20501: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17486  037134  037066                  R0501                   ;ERROR LOOP RETURN
17487
17488  037136  000004          00501:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17489
```

```
17490                                   ; ***************************************************************************
17491                                           .SBTTL T0502 MOV SM2,DM6 TEST - <N:C> = 1011
17492                                   ; ***************************************************************************
17493
17494                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17495
17496                                   ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8
17497
17498                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
17499                                                   ; / 16[125]016,016
17500
17501                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17502
17503                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17504
17505                                   ;SYNC:          B05J2 (-) T = 4 USEC
17506
17507                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=6L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17508
17509  037140  012700  000502          T0502:  MOV     #0502,R0                ;LOAD R0 WITH TEST NO.
17510  037144  013701  037176                  MOV     @#I0502,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17511  037150  005004                          CLR     R4              ;RESULT S / B = 000000
17512  037152  012702  067610                  MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
17513  037156  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17514  037162  012703  067602          R0502:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
17515  037166  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17516  037170  005112                          COM     (R2)
17517  037172  000257                          CCC                     ;CLEAR FLAGS
17518  037174  000273                          273                     ;N:C = 1011
17519
17520  037176  012563  000006          I0502:  MOV     (R5)+,6(R3)     ;TEST THE MOV - SM2,DM6
17521
17522  037202  100403                          BMI     E10502          ;N:C = 0101 ?
17523  037204  001002                          BNE     E10502
17524  037206  102401                          BVS     E10502
17525  037210  103402                          BCS     A0502
17526
17527  037212  104005          E10502: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17528  037214  037162                  R0502                   ;ERROR LOOP RETURN
17529
17530  037216  020412          A0502:  CMP     R4,(R2)         ;RESULT CORRECT ??
17531  037220  001404                  BEQ     00502           ;BR IF YES
17532
17533  037222  005003                  CLR     R3              ;GET THE WAS DATA
17534  037224  051203                  BIS     (R2),R3
17535  037226  104000          E20502: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17536  037230  037162                  R0502                   ;ERROR LOOP RETURN
17537
17538  037232  000004          00502:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17539
```

```
17540                                   ; ***************************************************************************
17541                                           .SBTTL T0503 MOV SM1,DM7 TEST - ‹N:C› = 0100
17542                                   ; ***************************************************************************
17543
17544                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17545
17546                                   ;ROM SEQ:       [141,247,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8
17547
17548                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,213 / 22[207]200,200
17549                                                   ; / 16[125]016,016
17550
17551                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17552
17553                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17554
17555                                   ;SYNC:          BOSJ2 (-) T = 5 USEC
17556
17557                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=7L  /  K3-3 MOV L
17558
17559  037234  012700  000503          T0503:  MOV     #0503,R0                ;LOAD R0 WITH TEST NO.
17560  037240  013701  037272                  MOV     @#I0503,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17561  037244  005004                          CLR     R4              ;RESULT S / B = 177777
17562  037246  005104                          COM     R4
17563  037250  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17564  037254  012705  067614                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17565  037260  012703  067566          R0503:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
17566  037264  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
17567  037266  000257                          CCC                     ;CLEAR FLAGS
17568  037270  000264                          264                     ;N:C = 0100
17569
17570  037272  011573  000010          I0503:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM1,DM7
17571
17572  037276  100003                          BPL     E10503          ;N:C = 1000 ?
17573  037300  001402                          BEQ     E10503
17574  037302  102401                          BVS     E10503
17575  037304  103002                          BCC     A0503
17576
17577  037306  104005          E10503: ERROR5                          ;MOV FAILED TO ALTER CODES PROPERLY
17578  037310  037260                  R0503                           ;ERROR LOOP RETURN
17579
17580  037312  020412          A0503:  CMP     R4,(R2)                 ;RESULT CORRECT ??
17581  037314  001404                  BEQ     00503                   ;BR IF YES
17582
17583  037316  005003                  CLR     R3                      ;GET THE WAS DATA
17584  037320  051203                  BIS     (R2),R3
17585  037322  104000          E20503: ERROR                           ;MOV DELIVERED THE WRONG RESULT
17586  037324  037260                  R0503                           ;ERROR LOOP RETURN
17587
17588  037326  000004          00503:  SCOPE                           ;CALL SCOPE LOOP UTILITY
17589
```

```
17590                                   ; ************************************************************************
17591                                           .SBTTL T0504 MOV SM2,DM7 TEST - <N:C> = 0100
17592                                   ; ************************************************************************
17593
17594                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17595
17596                                   ;ROM SEQ:       [142,240,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8
17597
17598                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,213 / 21[207]200,200
17599                                                   ; / 16[125]016,016
17600
17601                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777
17602
17603                                   ;CODES:         [125] SPS=3  /  N:C = 1000
17604
17605                                   ;SYNC:          BOSJ2 (-) T = 5 USEC
17606
17607                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=7L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17608
17609  037330  012700  000504           T0504:  MOV     #0504,R0                ;LOAD R0 WITH TEST NO.
17610  037334  013701  037400                   MOV     @#I0504,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17611  037340  032737  001000  066642           BIT     #1000,@#BPTLOC  ;BREAKPOINT HALT SET ??
17612  037346  001401                           BEQ     .+4             ;BR IF NOT
17613  037350  000000                           HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
17614  037352  005004                           CLR     R4              ;RESULT S / B = 177777
17615  037354  005104                           COM     R4
17616  037356  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17617  037362  012705  067614                   MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
17618  037366  012703  067566           R0504:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
17619  037372  005012                           CLR     (R2)            ;MAKE [DEST] = 000000
17620  037374  000257                           CCC                     ;CLEAR FLAGS
17621  037376  000264                           264                     ;N:C = 0100
17622
17623  037400  011573  000010           I0504:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM2,DM7
17624
17625  037404  100003                           BPL     E10504          ;N:C = 1000 ?
17626  037406  001402                           BEQ     E10504
17627  037410  102401                           BVS     E10504
17628  037412  103002                           BCC     A0504
17629
17630  037414  104005           E10504: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17631  037416  037366                   R0504                   ;ERROR LOOP RETURN
17632
17633  037420  020412           A0504:  CMP     R4,(R2)         ;RESULT CORRECT ??
17634  037422  001404                   BEQ     00504           ;BR IF YES
17635
17636  037424  005003                   CLR     R3              ;GET THE WAS DATA
17637  037426  051203                   BIS     (R2),R3
17638  037430  104000           E20504: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17639  037432  037366                   R0504                   ;ERROR LOOP RETURN
17640
17641  037434  000004           00504:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17642
```

```
17643                                   ; ************************************************************************
17644                                           .SBTTL T0505 MOV SM1,DM7 TEST - <N:C> = 1011
17645                                   ; ************************************************************************
17646
17647                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17648
17649                                   ;ROM SEQ:       [141,247,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8
17650
17651                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,213 / 22[207]200,200
17652                                                   ; / 16[125]016,016
17653
17654                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17655
17656                                   ;CODES:         [125] SPS= 3  /  N:C = 0101
17657
17658                                   ;SYNC:          BOSJ2 (-) T = 5 USEC
17659
17660                                   ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=7L  /  K3-3 MOV L
17661
17662  037436  012700  000505          T0505:  MOV     #0505,R0                ;LOAD R0 WITH TEST NO.
17663  037442  013701  037474                  MOV     @#I0505,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17664  037446  005004                          CLR     R4              ;RESULT S / B = 000000
17665  037450  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17666  037454  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17667  037460  012703  067566          R0505:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
17668  037464  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17669  037466  005112                          COM     (R2)
17670  037470  000257                          CCC                     ;CLEAR FLAGS
17671  037472  000273                          273                     ;N:C = 1011
17672
17673  037474  011573  000010          I0505:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM1,DM7
17674
17675  037500  100403                          BMI     E10505          ;N:C = 0101 ?
17676  037502  001002                          BNE     E10505
17677  037504  102401                          BVS     E10505
17678  037506  103402                          BCS     A0505
17679
17680  037510  104005          E10505: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
17681  037512  037460                  R0505                   ;ERROR LOOP RETURN
17682
17683  037514  020412          A0505:  CMP     R4,(R2)         ;RESULT CORRECT ??
17684  037516  001404                  BEQ     00505           ;BR IF YES
17685
17686  037520  005003                  CLR     R3              ;GET THE WAS DATA
17687  037522  051203                  BIS     (R2),R3
17688  037524  104000          E20505: ERROR                   ;MOV DELIVERED THE WRONG RESULT
17689  037526  037460                  R0505                   ;ERROR LOOP RETURN
17690
17691  037530  000004          00505:  SCOPE                   ;CALL SCOPE LOOP UTILITY
17692
```

```
17693                                   ; ***************************************************************************
17694                                          .SBTTL T0506 MOV SM2,DM7 TEST - <N:C> = 1011
17695                                   ; ***************************************************************************
17696
17697                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17698
17699                                   ;ROM SEQ:       [142,240,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8
17700
17701                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,213 / 22[207]200,200
17702                                   ; / 16[125]016,016
17703
17704                                   ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000
17705
17706                                   ;CODES:         [125] SPS=3  /  N:C = 0101
17707
17708                                   ;SYNC:          B05J2 (-) T = 5 USEC
17709
17710                                   ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=7L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
17711
17712  037532  012700  000506          T0506:  MOV     #0506,R0                ;LOAD R0 WITH TEST NO.
17713  037536  013701  037570                  MOV     @#I0506,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
17714  037542  005004                          CLR     R4              ;RESULT S / B = 000000
17715  037544  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17716  037550  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
17717  037554  012703  067566          R0506:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
17718  037560  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
17719  037562  005112                          COM     (R2)
17720  037564  000257                          CCC                     ;CLEAR FLAGS
17721  037566  000273                          273                     ;N:C = 1011
17722
17723  037570  011573  000010          I0506:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM2,DM7
17724
17725  037574  100403                          BMI     E10506          ;N:C = 0101 ?
17726  037576  001002                          BNE     E10506
17727  037600  102401                          BVS     E10506
17728  037602  103402                          BCS     A0506
17729
17730  037604  104005          E10506: ERROR5                          ;MOV FAILED TO ALTER CODES PROPERLY
17731  037606  037554                  R0506                           ;ERROR LOOP RETURN
17732
17733  037610  020412          A0506:  CMP     R4,(R2)         ;RESULT CORRECT ??
17734  037612  001404                  BEQ     00506           ;BR IF YES
17735
17736  037614  005003                  CLR     R3              ;GET THE WAS DATA
17737  037616  051203                  BIS     (R2),R3
17738  037620  104000          E20506: ERROR                           ;MOV DELIVERED THE WRONG RESULT
17739  037622  037554                  R0506                           ;ERROR LOOP RETURN
17740
17741  037624  000004          00506:  SCOPE                           ;CALL SCOPE LOOP UTILITY
17742
```

```
17743                                   ; ***************************************************************
17744                                          .SBTTL T0507 MOV  SM0,DM1 TEST
17745                                   ; ***************************************************************
17746
17747                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17748
17749                                   ;ROM SEQ:       [171,257,201,125,375,016] FC 1,4,8
17750
17751                                   ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,016
17752
17753                                   ;EXEC:          [201]ALUC=LLLLL :[125]D=TEST NO.
17754
17755                                   ;CODES:         [125] SPS=3      /      N:C=X000
17756
17757                                   ;SYNC:          B05J2   (-)     T=2.42 USEC
17758
17759                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L
17760
17761  037626  012700  000507          T0507:  MOV     #0507,R0                ;LOAD R0 WITH TEST NO.
17762  037632  013701  037652                  MOV     @#I0507,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17763  037636  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17764  037642  010004                          MOV     R0,R4           ;RESULT S / B = #T0507
17765  037644  010205                  R0507:  MOV     R2,R5           ;R5 GETS DEST ADDR
17766  037646  005012                          CLR     (R2)            ;[DEST] = 000000
17767  037650  000257                          CCC                     ;SCOPE SYNC
17768
17769  037652  010015                  I0507:  MOV     R0,(R5)         ;TEST THE MOV
17770
17771  037654  020412                          CMP     R4,(R2)         ;RESULT CORRECT ?
17772  037656  001403                          BEQ     00507           ;BR IF YES
17773
17774  037660  011203                          MOV     (R2),R3         ;GET THE WAS DATA
17775  037662  104000                  E0507:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
17776  037664  037644                          R0507                   ;ERROR LOOP RETURN ADDRESS
17777
17778  037666  000004                  00507:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
17779                                   ; ***************************************************************************
17780                                           .SBTTL T0510 MOV  SM0,DM2 TEST
17781                                   ; ***************************************************************************
17782
17783                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17784
17785                                   ;ROM SEQ:       [172,257,201,125,375,016] FC 1,4,8
17786
17787                                   ;ACT BUTS:      37[004]100,172  /  22[172]200,201  /  16[125]016,016
17788
17789                                   ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.
17790
17791                                   ;CODES:         [125]SPS=3      /      N:C=X000
17792
17793                                   ;SYNC:          B05J2   (-)     T=2.5 USEC
17794
17795                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=2 L  /  K5-5 BCON(1+2) H
17796                                                   ;K3-8 CIN00 L
17797
17798  037670  012700  000510          T0510:  MOV     #0510,R0                ;LOAD R0 WITH TEST NO.
17799  037674  013701  037714                  MOV     @#I0510,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17800  037700  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17801  037704  010004                          MOV     R0,R4           ;RESULT S / B = #T0510
17802  037706  010205          R0510:  MOV     R2,R5           ;R5 GETS DEST ADDR
17803  037710  005012                  CLR     (R2)            ;[DEST] = 000000
17804  037712  000257                  CCC                     ;SCOPE SYNC
17805
17806  037714  010025          I0510:  MOV     R0,(R5)+        ;TEST THE MOV
17807
17808  037716  020412                  CMP     R4,(R2)         ;RESULT CORRECT ?
17809  037720  001403                  BEQ     00510           ;BR IF YES
17810
17811  037722  011203                  MOV     (R2),R3         ;GET THE WAS DATA
17812  037724  104000          E0510:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
17813  037726  037706                  R0510                   ;ERROR LOOP RETURN ADDRESS
17814
17815  037730  000004          00510:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
17816
```

```
17817                                   ; ***************************************************************
17818                                         .SBTTL TO511 MOV  SM0,DM3 TEST
17819                                   ; ***************************************************************
17820
17821                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17822
17823                                   ;ROM SEQ:       [173,207,210,201,125,375,016] FC 1,4,8
17824
17825                                   ;ACT BUTS:      37[004]100,173  /  22[207]200,201  /  16[125]016,016
17826
17827                                   ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.
17828
17829                                   ;CODES:         [125]SPS=3       /      N:C=X000
17830
17831                                   ;SYNC:          B05J2   (-)     T=3.2 USEC
17832
17833                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=3 L  /  K5-5 BC01 H
17834
17835  037732  012700  000511           TO511:  MOV     #0511,R0                ;LOAD R0 WITH TEST NO.
17836  037736  013701  037760                   MOV     @#I0511,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17837  037742  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17838  037746  010004                           MOV     R0,R4           ;RESULT S / B = #T0511
17839  037750  012705  067576           R0511:  MOV     #ATA+10,R5      ;BASE DEST ADDR = ATA+10
17840  037754  005012                           CLR     (R2)            ;[DEST] = 000000
17841  037756  000257                           CCC                     ;SCOPE SYNC
17842
17843  037760  010035                   I0511:  MOV     R0,@(R5)+       ;TEST THE MOV
17844
17845  037762  020412                           CMP     R4,(R2)         ;CORRECT RESULT
17846  037764  001403                           BEQ     00511           ;BR IF YES
17847
17848  037766  011203                           MOV     (R2),R3         ;GET THE WAS DATA
17849  037770  104000                   E0511:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
17850  037772  037750                           R0511                   ;ERROR LOOP RETURN ADDRESS
17851
17852  037774  000004                   00511:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
17853
```

```
17854                                   ; ***************************************************************************
17855                                         .SBTTL T05!2 MOV  SM0,DM4 TEST
17856                                   ; ***************************************************************************
17857
17858                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17859
17860                                   ;ROM SEQ:       [174,257,201,125,375,016] FC 1,4,8
17861
17862                                   ;ACT BUTS:      37[004]100,174  /  22[174]200,201  /  16[125]016,016
17863
17864                                   ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.
17865
17866                                   ;CODES:         [125]SPS=3       /      N:C=X000
17867
17868                                   ;SYNC:          B05J2   (-)     T=2.5 USEC
17869
17870                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=4 L  /  K5-5 BCON(1+2) H
17871                                                   ;K3-8 CINOO L
17872
17873  037776  012700  000512          T0512:  MOV     #0512,R0                ;LOAD R0 WITH TEST NO.
17874  040002  013701  040024                  MOV     @#I0512,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17875  040006  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17876  040012  010004                          MOV     R0,R4           ;RESULT S / B = #T0512
17877  040014  012705  067604          R0512:  MOV     #MBUF0+2,R5     ;R5 CONTAINS BASE DEST ADDR
17878  040020  005012                          CLR     (R2)            ;[DEST] = 000000
17879  040022  000257                          CCC                     ;SCOPE SYNC
17880
17881  040024  010045                  I0512:  MOV     R0,-(R5)        ;TEST THE MOV
17882
17883  040026  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
17884  040030  001403                          BEQ     00512           ;BR IF YES
17885
17886  040032  011203                          MOV     (R2),R3         ;GET THE WAS DATA
17887  040034  104000                  E0512:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
17888  040036  040014                          R0512                   ;ERROR LOOP RETURN ADDRESS
17889
17890  040040  000004                  00512:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
17891
```

```
17892                                   ; ***************************************************************************
17893                                          .SBTTL T0513 MOV  SM0,DM5 TEST
17894                                   ; ***************************************************************************
17895
17896                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17897
17898                                   ;ROM SEQ:       [175,207,210,201,125,375,016] FC 1,4,8
17899
17900                                   ;ACT BUTS:      37[004]100,175  /  22[207]200,201  /  16[125]016,016
17901
17902                                   ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.
17903
17904                                   ;CODES:         [125]SPS=3       /      N:C=X000
17905
17906                                   ;SYNC:          B05J2   (-)     T= 3.2 USEC
17907
17908                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=5 L  /  K5-5 BC01 H
17909
17910  040042  012700  000513          T0513:  MOV     #0513,R0                ;LOAD R0 WITH TEST NO.
17911  040046  013701  040070                  MOV     @#I0513,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17912  040052  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
17913  040056  010004                          MOV     R0,R4           ;RESULT S / B = #T0513
17914  040060  012705  067600          R0513:  MOV     #ATA+12,R5      ;R5 CONTAINS BASE DEST ADDR
17915  040064  005012                          CLR     (R2)            ;[DEST] = 000000
17916  040066  000257                          CCC                     ;SCOPE SYNC
17917
17918  040070  010055          I0513:  MOV     R0,@-(R5)               ;TEST THE MOV
17919
17920  040072  020412                  CMP     R4,(R2)                 ;CORRECT RESULT ?
17921  040074  001403                  BEQ     00513                   ;BR IF YES
17922
17923  040076  011203                  MOV     (R2),R3                 ;GET THE WAS DATA
17924  040100  104000          E0513:  ERROR                           ;MOV DELIVERED THE WRONG RESULT
17925  040102  040060                  R0513                           ;ERROR LOOP RETURN ADDRESS
17926
17927  040104  000004          00513:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
17928
```

```
17929                                   ; ***************************************************************************
17930                                           .SBTTL T0514 MOV  SM0,DM6 TEST
17931                                   ; ***************************************************************************
17932
17933                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17934
17935                                   ;ROM SEQ:       [176,206,212,201,125,375,016] FC 1,4,8
17936
17937                                   ;ACT BUTS:      37[004]100,176  /  17[176]212,212  /  21[206]200,201
17938                                   ; /  16[125]016,016
17939
17940                                   ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.
17941
17942                                   ;CODES:         [125]SPS=3       /      N:C=X000
17943
17944                                   ;SYNC:          B05J2   (-)     T= 2.84 USEC
17945
17946                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=6 L  /  K5-5 BC01 H
17947                                   ;K4-4 OVLAP CYCLE L
17948
17949  040106  012700  000514       T0514:  MOV     #0514,R0                ;LOAD R0 WITH TEST NO.
17950  040112  013701  040134               MOV     @#I0514,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17951  040116  012702  067606               MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
17952  040122  010004                       MOV     R0,R4           ;RESULT S / B = #T0514
17953  040124  012705  067602               MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
17954  040130  005012               R0514:  CLR     (R2)            ;[DEST] = 000000
17955  040132  000257                       CCC                     ;SCOPE SYNC
17956
17957  040134  010065  000004       I0514:  MOV     R0,4(R5)        ;TEST THE MOV
17958
17959  040140  020412                       CMP     R4,(R2)         ;RESULT CORRECT ?
17960  040142  001403                       BEQ     00514           ;BR IF YES
17961
17962  040144  011203                       MOV     (R2),R3         ;GET THE WAS DATA
17963  040146  104000               E0514:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
17964  040150  040130                       R0514                   ;ERROR LOOP RETURN ADDRESS
17965
17966  040152  000004               00514:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
17967                                   ; ************************************************************************
17968                                          .SBTTL T0515 MOVB TEST - SM0,DM0 - EXTEND 1'S
17969                                   ; ************************************************************************
17970
17971                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
17972
17973                                   ;ROM SEQ:       [170,204,003,204,001] FC 1,4
17974
17975                                   ;ACT BUTS:      37[004]100,170 / 20[170]000,003 / 27[003]000,001
17976
17977                                   ;EXEC:          [170]ALUC=LLLLL :[204] AND TIME D = 177652
17978
17979                                   ;CODES:         [204] SPS=3  /  N:C = 1000
17980
17981                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
17982
17983                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=0L  /  K3-3 DM=0L
17984
17985  040154  012700  000515          T0515:  MOV     #0515,R0                ;LOAD R0 WITH TEST NO.
17986  040160  013701  040206                  MOV     @#I0515,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
17987  040164  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
17988  040170  012704  177652                  MOV     #177652,R4      ;RESULT S / B = 177652
17989  040174  012705  000252                  MOV     #252,R5         ;SOURCE OP = 252
17990  040200  005003                  R0515:  CLR     R3              ;[DEST] = 000000
17991  040202  000257                          CCC                     ;CLEAR FLAGS
17992  040204  000266                          266                     ;N:C = 0110
17993
17994  040206  110503                  I0515:  MOVB    R5,R3           ;TEST THE MOVB
17995
17996  040210  100003                          BPL     E10515          ;N:C = 1000 ?
17997  040212  001402                          BEQ     E10515
17998  040214  102401                          BVS     E10515
17999  040216  103002                          BCC     A0515
18000
18001  040220  104005                  E10515: ERROR5                  ;MOVB FAILED TO ALTER CODES PROPERLY
18002  040222  040200                          R0515                   ;ERROR LOOP RETURN ADDRESS
18003
18004  040224  020403                  A0515:  CMP     R4,R3           ;RESULT CORRECT ?
18005  040226  001402                          BEQ     00515           ;BR IF YES
18006
18007  040230  104000                  E20515: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18008  040232  040200                          R0515                   ;ERROR LOOP RETURN ADDRESS
18009
18010  040234  000004                  00515:  SCOPE                   ;CALL SCOPE LOOP UTILITY
18011
18012
```

```
18013                                   ; ***************************************************************************
18014                                           .SBTTL T0516 MOVB TEST - SM0,DM0 - EXTEND 0'S
18015                                   ; ***************************************************************************
18016
18017                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18018
18019                                   ;ROM SEQ:       [170,204,003,204,001] FC 1,4
18020
18021                                   ;ACT BUTS:      37[004]100,170 / 20[170]000,003 / 27[003]000,001
18022
18023                                   ;EXEC:          [170]ALUC=LLLLL :[204] D = 000000
18024
18025                                   ;CODES:         [204] SPS=3  /  N:C = 0101
18026
18027                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
18028
18029                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L
18030
18031  040236  012700  000516           T0516:  MOV     #0516,R0                ;LOAD R0 WITH TEST NO.
18032  040242  013701  040270                   MOV     @#I0516,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18033  040246  012702  177703                   MOV     #177703,R2      ;DEST ADDR = R3
18034  040252  005004                           CLR     R4              ;RESULT S / B = 000000
18035  040254  012705  177400                   MOV     #177400,R5      ;SOURCE OP = 177400
18036  040260  005003                   R0516:  CLR     R3              ;[DEST] = 177777
18037  040262  005103                           COM     R3
18038  040264  000257                           CCC                     ;CLEAR FLAGS
18039  040266  000271                           271                     ;N:C = 1001
18040
18041  040270  110503                   I0516:  MOVB    R5,R3           ;TEST THE MOVB
18042
18043  040272  100403                           BMI     E10516          ;N:C = 0101 ?
18044  040274  001002                           BNE     E10516
18045  040276  102401                           BVS     E10516
18046  040300  103402                           BCS     A0516
18047
18048  040302  104005                   E10516: ERROR5                  ;MOVB FAILED TO ALTER CODES PROPERLY
18049  040304  040260                           R0516                   ;ERROR LOOP RETURN ADDRESS
18050
18051  040306  020403                   A0516:  CMP     R4,R3           ;RESULT CORRECT ?
18052  040310  001402                           BEQ     00516           ;BR IF YES
18053
18054  040312  104000                   E20516: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18055  040314  040260                           R0516                   ;ERROR LOOP RETURN ADDRESS
18056
18057  040316  000004                   00516:  SCOPE                   ;CALL SCOPE LOOP UTILITY
18058
18059
```

```
18060                                   ; ************************************************************************
18061                                          .SBTTL T0517 MOVB TEST - SM1,DMO - SOURCE ADDR EVEN
18062                                   ; ************************************************************************
18063
18064                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18065
18066                                   ;ROM SEQ:       [141,247,250,160,204,003,204,000] FC 1,2,4
18067
18068                                   ;ACT BUTS:      37[004]140,141 / 35[247]120,160 / 20[160]000,003 / 27[003]000,000
18069
18070                                   ;EXEC:          [160]ALUC=LLLLL :[204] 2ND TIME D = 000000
18071
18072                                   ;CODES:         [204] SPS=3  /  N:C = 0100
18073
18074                                   ;SYNC:          BOSJ2 (-) T = 2 USEC
18075
18076                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=1L  /  K3-3 DM=0L
18077
18078  040320  012700  000517          T0517:  MOV     #0517,R0                ;LOAD R0 WITH TEST NO.
18079  040324  013701  040350                  MOV     @#I0517,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18080  040330  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
18081  040334  005004                          CLR     R4              ;RESULT S / B = 000000
18082  040336  012705  070152                  MOV     #DBTA,R5        ;SOURCE ADDR = DBTA
18083  040342  005003                  R0517:  CLR     R3              ;[DEST] = 177777
18084  040344  005103                          COM     R3
18085  040346  000257                          CCC                     ;SCOPE SYNC
18086
18087  040350  111503                  I0517:  MOVB    (R5),R3         ;TEST THE MOVB
18088
18089  040352  020403                          CMP     R4,R3           ;RESULT CORRECT ?
18090  040354  001402                          BEQ     00517           ;BR IF YES
18091
18092  040356  104000                  E0517:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18093  040360  040342                          R0517                   ;ERROR LOOP RETURN ADDRESS
18094
18095  040362  000004                  00517:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18096                                   ; ***************************************************************************
18097                                          .SBTTL T0520 MOVB TEST - SM1,DMO - SOURCE ADDR ODD
18098                                   ; ***************************************************************************
18099
18100                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18101
18102                                   ;ROM SEQ:       [141,247,250,137,251,160,204,003,204,000] FC 1,2,4
18103
18104                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 20[160]000,003 / 27[003]000,000
18105
18106                                   ;EXEC:          [160]ALUC=LLLLL :[204](2ND TIME)  D = 000125
18107
18108                                   ;CODES:         [204] SPS=3  /  N:C = 0000
18109
18110                                   ;SYNC:          B05J2 (-) T = 2 USEC
18111
18112                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-7 ODD BYTE H  /  K1-6 BA00 (1) H
18113
18114  040364  012700  000520          T0520:  MOV     #0520,R0                ;LOAD R0 WITH TEST NO.
18115  040370  013701  040416                  MOV     @#I0520,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18116  040374  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
18117  040400  012704  000125                  MOV     #125,R4         ;RESULT S / B = 125
18118  040404  012705  070155                  MOV     #DBTA+3,R5      ;SOURCE ADDR = DBTA+3
18119  040410  012703  177400          R0520:  MOV     #177400,R3      ;[DEST] = 177400
18120  040414  000257                          CCC                     ;SCOPE SYNC
18121
18122  040416  111503                  I0520:  MOVB    (R5),R3         ;TEST THE MOVB
18123
18124  040420  020403                          CMP     R4,R3           ;RESULT CORRECT ?
18125  040422  001402                          BEQ     00520           ;BR IF YES
18126
18127  040424  104000                  E0520:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18128  040426  040410                          R0520                   ;ERROR LOOP RETURN ADDRESS
18129
18130  040430  000004                  00520:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18131                                   ; ***************************************************************************
18132                                          .SBTTL T0521 MOVB TEST - SM2,DMO - SOURCE ADDR ODD
18133                                   ; ***************************************************************************
18134
18135                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18136
18137                                   ;ROM SEQ:       [142,240,250,137,251,160,204,003,204,000] FC 1,2,4
18138
18139                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,160 / 20[160]000,003
18140                                   ; / 27[003]000,000
18141
18142                                   ;EXEC:          [160]ALUC=LLLLL :[204] 2ND TIME D = 177777
18143
18144                                   ;CODES:         [204] SPS=3  /  N:C = 1000
18145
18146                                   ;SYNC:          B05J2 (-) T = 2.1 USEC
18147
18148                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
18149                                   ;  K1-6 BADD (1) H
18150
18151  040432  012700  000521          T0521:  MOV     #0521,R0                ;LOAD R0 WITH TEST NO.
18152  040436  013701  040462                  MOV     @#I0521,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18153  040442  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
18154  040446  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
18155  040452  012705  070153          R0521:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
18156  040456  005003                          CLR     R3              ;[DEST] = 000000
18157  040460  000257                          CCC                     ;SCOPE SYNC
18158
18159  040462  112503                  I0521:  MOVB    (R5)+,R3        ;TEST THE MOVB
18160
18161  040464  020403                          CMP     R4,R3           ;RESULT CORRECT ?
18162  040466  001402                          BEQ     A0521           ;BR IF YES
18163
18164  040470  104000                  E10521: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18165  040472  040452                          R0521                   ;ERROR LOOP RETURN ADDRESS
18166
18167  040474  022705  070154          A0521:  CMP     #DBTA+2,R5      ;DID MOVB INCREMENT SRC REG ?
18168  040500  001402                          BEQ     00521           ;BR IF YES
18169
18170  040502  104005                  E20521: ERROR5                  ;MOVB FAILED TO UPDATE SRC REG
18171  040504  040452                          R0521                   ;ERROR LOOP RETURN ADDRESS
18172
18173  040506  000004                  00521:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18174                                   ; ***************************************************************************
18175                                          .SBTTL T0522 MOVB TEST - SM2,DMO - SOURCE ADDR EVEN
18176                                   ; ***************************************************************************
18177
18178                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18179
18180                                   ;ROM SEQ:       [142,240,250,160,204,003,204,000] FC 1,2,4
18181
18182                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,003 / 27[003]000,000
18183
18184                                   ;EXEC:          [160]ALUC=LLLLL :[204]2ND TIME D = 000000
18185
18186                                   ;CODES:         [204] SPS=3  /  N:C - 0100
18187
18188                                   ;SYNC:          BOSJ2 (-) T = 2.1 USEC
18189
18190                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H
18191
18192  040510  012700  000522          T0522:  MOV     #0522,R0                ;LOAD R0 WITH TEST NO.
18193  040514  013701  040540                  MOV     @#I0522,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18194  040520  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
18195  040524  005004                          CLR     R4              ;RESULT S / B = 000000
18196  040526  012705  070152          R0522:  MOV     #DBTA,R5        ;SOURCE ADDR = DBTA
18197  040532  012703  177400                  MOV     #177400,R3      ;[DEST] = 177400
18198  040536  000257                          CCC                     ;SCOPE SYNC
18199
18200  040540  112503                  I0522:  MOVB    (R5)+,R3                ;TEST THE MOVB
18201
18202  040542  020403                          CMP     R4,R3           ;RESULT CORRECT ?
18203  040544  001402                          BEQ     A0522           ;BR IF YES
18204
18205  040546  104000                  E10522: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18206  040550  040526                          R0522                   ;ERROR LOOP RETURN ADDRESS
18207
18208  040552  022705  070153          A0522:  CMP     #DBTA+1,R5      ;DID MOVB INCREMENT SRC REG ?
18209  040556  001402                          BEQ     00522           ;BR IF YES
18210
18211  040560  104005                  E20522: ERROR5                  ;MOVB FAILED TO UPDATE SOURCE REG
18212  040562  040526                          R0522                   ;ERROR LOOP RETURN ADDRESS
18213
18214  040564  000004                  00522:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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18215                                   ; ************************************************************************
18216                                          .SBTTL T0523 MOVB TEST - SM1,DM1 - SRC ADR ODD / DST ADR EVEN
18217                                   ; ************************************************************************
18218
18219                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18220
18221                                   ;ROM SEQ:       [141,247,250,137,251,171,257,202,205,125,375,016] FC 1,2,4,8
18222
18223                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,171 / 22[171]200,202
18224                                                   ; / 16[125]016,016
18225
18226                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18227
18228                                   ;CODES:         [125] SPS=3  /  N:C = 1000
18229
18230                                   ;SYNC:          BOSJ2 (-) T = 3.2 USEC
18231
18232                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=1L  /  K3-3 DM=1L
18233                                                   ;  K1-6 BADD(1) H  /  K3-7 ODD BYTE H
18234
18235  040566  012700  000523   T0523:  MOV     #0523,R0            ;LOAD R0 WITH TEST NO.
18236  040572  013701  040616            MOV     @#I0523,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18237  040576  012702  067602            MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18238  040602  012704  000377            MOV     #377,R4         ;RESULT S / B = 377
18239  040606  012705  070153            MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18240  040612  005012           R0523:   CLR     (R2)            ;[DEST] = 000000
18241  040614  000257                    CCC                     ;CLEAR FLAGS - SCOPE SYNC
18242
18243  040616  111512           I0523:   MOVB    (R5),(R2)       ;TEST THE MOVB
18244
18245  040620  020412                    CMP     R4,(R2)         ;CORRECT RESULT ?
18246  040622  001403                    BEQ     00523           ;BR IF YES
18247
18248  040624  011203                    MOV     (R2),R3         ;GET THE WAS DATA
18249  040626  104000           E0523:   ERROR                   ;MOVB DELIVERED WRONG RESULT
18250  040630  040612                    R0523                   ;ERROR LOOP RETURN ADDRESS
18251
18252  040632  000004           00523:   SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18253                                   ; ************************************************************************
18254                                          .SBTTL T0524 MOVB TEST - SM1,DM2 - SRC ADR ODD / DST ADR EVEN
18255                                   ; ************************************************************************
18256
18257                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18258
18259                                   ;ROM SEQ:       [141,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4,8
18260
18261                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
18262                                   ; / 16[125]016,016
18263
18264                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18265
18266                                   ;CODES:         [125] SPS=3  /  N:C = 1000
18267
18268                                   ;SYNC:          BOSJ2 (-) T = 3.7 USEC
18269
18270                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
18271                                   ;  K1-6 BADD(1) H
18272
18273  040634  012700  000524      T0524:  MOV     #0524,R0                ;LOAD R0 WITH TEST NO.
18274  040640  013701  040666              MOV     @#I0524,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18275  040644  012702  067602              MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18276  040650  012704  000377              MOV     #377,R4         ;RESULT S / B = 377
18277  040654  012705  070153              MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18278  040660  005012              R0524:  CLR     (R2)            ;[DEST] = 000000
18279  040662  010203                      MOV     R2,R3           ;[R3] = DEST ADDR
18280  040664  000257                      CCC                     ;CLEAR FLAGS - SCOPE SYNC
18281
18282  040666  111523              I0524:  MOVB    (R5),(R3)+      ;TEST THE MOVB
18283
18284  040670  020412                      CMP     R4,(R2)         ;CORRECT RESULT ?
18285  040672  001403                      BEQ     A0524           ;BR IF YES
18286
18287  040674  011203                      MOV     (R2),R3         ;GET THE WAS DATA
18288  040676  104000              E10524: ERROR                   ;MOVB DELIVERED WRONG RESULT
18289  040700  040660                      R0524                   ;ERROR LOOP RETURN ADDRESS
18290
18291  040702  022703  067603      A0524:  CMP     #MBUF0+1,R3     ;DID MOVB INCREMENT THE DEST REG ?
18292  040706  001402                      BEQ     00524           ;BR IF YES
18293
18294  040710  104005              E20524: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
18295  040712  040660                      R0524                   ;ERROR LOOP RETURN ADDRESS
18296
18297  040714  000004              00524:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18298                                   ; ************************************************************************
18299                                          .SBTTL T0525 MOVB TEST - SM1,DM3 - SRC ADR ODD / DST ADR EVEN
18300                                   ; ************************************************************************
18301
18302                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18303
18304                                   ;ROM SEQ:       [141,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4,8
18305
18306                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,173 / 22[207]200,202
18307                                                   ; / 16[125]016,016
18308
18309                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18310
18311                                   ;CODES:         [125] SPS=3  /  N:C = 1000
18312
18313                                   ;SYNC:          BO5J2 (-) T = 4 USEC
18314
18315                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
18316                                                   ;  K1-6 BADD (1) H
18317
18318  040716  012700  000525          T0525:  MOV     #0525,R0                ;LOAD R0 WITH TEST NO.
18319  040722  013701  040752                  MOV     @#I0525,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18320  040726  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18321  040732  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
18322  040736  012705  070153                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18323  040742  005012                  R0525:  CLR     (R2)            ;[DEST] = 000000
18324  040744  012703  067576                  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA +10
18325  040750  000257                          CCC                     ;CLEAR FLAGS - SCOPE SYNC
18326
18327  040752  111533          I0525:  MOVB    (R5),@(R3)+     ;TEST THE MOVB
18328
18329  040754  022703  067600                  CMP     #ATA+12,R3      ;DID DEST REG GET INCREMENTED ?
18330  040760  001402                          BEQ     A0525           ;BR IF YES
18331
18332  040762  104005          E10525: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
18333  040764  040742                  R0525                   ;ERROR LOOP RETURN ADDRESS
18334
18335  040766  020412          A0525:  CMP     R4,(R2)         ;CORRECT RESULT ?
18336  040770  001403                  BEQ     00525           ;BR IF YES
18337
18338  040772  011203                  MOV     (R2),R3         ;GET THE WAS DATA
18339  040774  104000          E20525: ERROR                   ;MOVB DELIVERED WRONG RESULT
18340  040776  040742                  R0525                   ;ERROR LOOP RETURN ADDRESS
18341
18342
18343  041000  000004          00525:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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18344                                   ; ***************************************************************
18345                                           .SBTTL T0526 MOVB TEST - SM1,DM4 - SRC ADR ODD / DST ADR EVEN
18346                                   ; ***************************************************************
18347
18348                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18349
18350                                   ;ROM SEQ:       [141,247,250,137,251,174,257,202,205,125,375,016] FC 1,2,4,8
18351
18352                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,174 / 22[174]200,202
18353                                   ; / 16[125]016,016
18354
18355                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18356
18357                                   ;CODES:         [125] SPS=3  /  N:C = 1000
18358
18359                                   ;SYNC:          BOSJ2 (-) T = 3.1 USEC
18360
18361                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
18362                                   ;  K1-6 BAOD(1) H
18363
18364  041002  012700  000526  T0526:  MOV     #0526,R0                ;LOAD R0 WITH TEST NO.
18365  041006  013701  041036          MOV     @#I0526,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18366  041012  012702  067602          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18367  041016  012704  000377          MOV     #377,R4         ;RESULT S / B = 377
18368  041022  012705  070153          MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18369  041026  005012          R0526:  CLR     (R2)            ;[DEST] = 000000
18370  041030  012703  067603          MOV     #MBUF0+1,R3     ;INITIAL DEST ADDR = MBUF0+1
18371  041034  000257                  CCC                     ;CLEAR FLAGS - SCOPE SYNC
18372
18373  041036  111543          I0526:  MOVB    (R5),-(R3)      ;TEST THE MOVB
18374
18375  041040  020302                  CMP     R3,R2           ;DID MOVB DECREMENT DEST REG ?
18376  041042  001402                  BEQ     A0526           ;BR IF YES
18377
18378  041044  104005          E10526: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
18379  041046  041026                  R0526                   ;ERROR LOOP RETURN ADDRESS
18380
18381  041050  020412          A0526:  CMP     R4,(R2)         ;CORRECT RESULT ?
18382  041052  001403                  BEQ     00526           ;BR IF YES
18383
18384  041054  011203                  MOV     (R2),R3         ;GET THE WAS DATA
18385  041056  104000          E20526: ERROR                   ;MOVB DELIVERED WRONG RESULT
18386  041060  041026                  R0526                   ;ERROR LOOP RETURN ADDRESS
18387
18388  041062  000004          00526:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18389                                   ; ************************************************************************
18390                                           .SBTTL T0527 MOVB TEST - SM1,DM5 - SRC ADR ODD / DST ADR EVEN
18391                                   ; ************************************************************************
18392
18393                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18394
18395                                   ;ROM SEQ:       [141,247,250,137,251,175,207,210,202,205,125,375,016] FC 1,2,4,8
18396
18397                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,175 / 22[207]200,202
18398                                                   ; / 16[125]016,016
18399
18400                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18401
18402                                   ;CODES:         [125] SPS=3  /  N:C = 1000
18403
18404                                   ;SYNC:          B05J2 (-) T = 4 USEC
18405
18406                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
18407                                                   ;  K1-6 BA00(1) H
18408
18409  041064  012700  000527          T0527:  MOV     #0527,R0                ;LOAD R0 WITH TEST NO.
18410  041070  013701  041120                  MOV     @#I0527,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18411  041074  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18412  041100  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
18413  041104  012705  070153                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18414  041110  005012                  R0527:  CLR     (R2)            ;[DEST] = 000000
18415  041112  012703  067600                  MOV     #ATA+12,R3      ;INITIAL DEST ADDR = ATA +12
18416  041116  000257                          CCC                     ;CLEAR FLAGS - SCOPE SYNC
18417
18418  041120  111553                  I0527:  MOVB    (R5),@-(R3)     ;TEST THE MOVB
18419
18420  041122  022703  067576                  CMP     #ATA+10,R3      ;DID MOVB DECREMENT DEST REG ?
18421  041126  001402                          BEQ     A0527           ;BR IF YES
18422
18423  041130  104005                  E10527: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
18424  041132  041110                          R0527                   ;ERROR LOOP RETURN ADDRESS
18425
18426  041134  020412                  A0527:  CMP     R4,(R2)         ;CORRECT RESULT ?
18427  041136  001403                          BEQ     00527           ;BR IF YES
18428
18429  041140  011203                          MOV     (R2),R3         ;GET THE WAS DATA
18430  041142  104000                  E20527: ERROR                   ;MOVB DELIVERED WRONG RESULT
18431  041144  041110                          R0527                   ;ERROR LOOP RETURN ADDRESS
18432
18433  041146  000004                  00527:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T0530 MOVB TEST - SM1,DM6 - SRC ADR ODD / DST ADR EVEN
                                        ; ************************************************************************
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;ROM SEQ:       [141,247,250,137,251,177,206,212,202,205,125,375,016] FC 1,2,4,8
                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,177 / 17[177]212,212
                                        ; / 21[206]200,202 / 16[125]016,016
                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
                                        ;CODES:         [125] SPS=3  /  N:C = 1000
                                        ;SYNC:          BOSJ2 (-) T = 4.4 USEC
                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-5 BC01 H  /  K3-7 ODD BYTE H
                                        ;  K1-6 BADD(1) H
041150  012700  000530        T0530:  MOV     #0530,R0                ;LOAD R0 WITH TEST NO.
041154  013701  041204                MOV     @#I0530,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041160  012702  067602                MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041164  012704  000377                MOV     #377,R4         ;RESULT S / B = 377
041170  012705  070153                MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
041174  005012                R0530:  CLR     (R2)            ;[DEST] = 000000
041176  012703  067610                MOV     #MBUF0+6,R3     ;BASE DEST ADDR = MBUF0+6
041202  000257                        CCC                     ;CLEAR FLAGS - SCOPE SYNC
041204  111563  177772        I0530:  MOVB    (R5),-6(R3)     ;TEST THE MOVB
041210  020412                        CMP     R4,(R2)         ;CORRECT RESULT ?
041212  001403                        BEQ     00530           ;BR IF YES
041214  011203                        MOV     (R2),R3         ;GET THE WAS DATA
041216  104000                E0530:  ERROR                   ;MOVB DELIVERED WRONG RESULT
041220  041174                        R0530                   ;ERROR LOOP RETURN ADDRESS
041222  000004                00530:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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18473                                   ; ***************************************************************************
18474                                          .SBTTL T0531 MOVB TEST - SM1,DM7 - SRC ADR ODD / DST ADR EVEN
18475                                   ; ***************************************************************************
18476
18477                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18478
18479                                   ;ROM SEQ:       [141,247,250,137,251,177,206,213,207,210,202,205,125,375,016] FC 1,2,4,8
18480
18481                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,177 / 17[177]212,213
18482                                                   ; / 21[206]XNU / 22[207]200,202 / 16[125]016,016
18483
18484                                   ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777
18485
18486                                   ;CODES:         [125] SPS=3  /  N:C - 1000
18487
18488                                   ;SYNC:          B05J2 (-) T = 4.8 USEC
18489
18490                                   ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
18491                                                   ;  K1-6 BA00 (1) H
18492
18493  041224  012700  000531          T0531:  MOV     #0531,R0                ;LOAD R0 WITH TEST NO.
18494  041230  013701  041260                  MOV     @#I0531,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18495  041234  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18496  041240  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
18497  041244  012705  070153                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
18498  041250  005012                  R0531:  CLR     (R2)            ;[DEST] = 000000
18499  041252  012703  067566                  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
18500  041256  000257                          CCC                     ;CLEAR FLAGS - SCOPE SYNC
18501
18502  041260  111573  000010          I0531:  MOVB    (R5),@10(R3)    ;TEST THE MOVB
18503
18504  041264  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
18505  041266  001403                          BEQ     00531           ;BR IF YES
18506
18507  041270  011203                          MOV     (R2),R3         ;GET THE WAS DATA
18508  041272  104000                  E0531:  ERROR                   ;MOVB DELIVERED WRONG RESULT
18509  041274  041250                          R0531                   ;ERROR LOOP RETURN ADDRESS
18510
18511  041276  000004                  00531:  SCOPE                   ;CALL SCOPE LOOP UTILITY
18512
18513
18514
```

```
18515                                   ; ***************************************************************************
18516                                          .SBTTL T0532 MOVB  SM0,DM1 TEST
18517                                   ; ***************************************************************************
18518
18519                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18520
18521                                   ;ROM SEQ:       [171,257,203,205,125,375,016] FC 1,4,8
18522
18523                                   ;ACT BUTS:      37[004]100,171  /  22[171]200,203  /  16[125]016,016
18524
18525                                   ;EXEC:          [203]ALUC=LLLLL :[125]D=177777
18526
18527                                   ;CODES:         [125]SPS=3       /      N:C=1000
18528
18529                                   ;SYNC:          B05J2   (-)     T=2.6 USEC
18530
18531                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
18532
18533  041300  012700  000532          T0532:  MOV     #0532,R0                ;LOAD R0 WITH TEST NO.
18534  041304  013701  041332                  MOV     @#I0532,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18535  041310  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18536  041314  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
18537  041320  012703  177777                  MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
18538  041324  010205                  R0532:  MOV     R2,R5           ;R5 CONTAINS DEST ADDR
18539  041326  005012                          CLR     (R2)            ;[DEST] = 000000
18540  041330  000257                          CCC                     ;SCOPE SYNC
18541
18542  041332  110315                  I0532:  MOVB    R3,(R5)         ;TEST THE MOVB
18543
18544  041334  020412                          CMP     R4,(R2)         ;RESULT CORRECT ?
18545  041336  001403                          BEQ     00532           ;BR IF YES
18546
18547  041340  011203                          MOV     (R2),R3         ;GET THE WAS DATA
18548  041342  104000                  E0532:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18549  041344  041324                          R0532                   ;ERROR LOOP RETURN ADDRESS
18550
18551  041346  000004                  00532:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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18552                                   ; ***************************************************************
18553                                          .SBTTL TO533 MOVB  SMO,DM2 TEST
18554                                   ; ***************************************************************
18555
18556                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18557
18558                                   ;ROM SEQ:       [172,257,203,205,125,375,016] FC 1,4,8
18559
18560                                   ;ACT BUTS:      37[004]100,172  /  22[172]200,203  /  16[125]016,016
18561
18562                                   ;EXEC:          [203]ALUC=LLLLL :[125]D=177777
18563
18564                                   ;CODES:         [125]SPS=3       /      N:C=1000
18565
18566                                   ;SYNC:          BOSJ2   (-)      T=2.6 USEC
18567
18568                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
18569                                   ;  K5-5 BCON(1+2) H
18570
18571  041350  012700  000533       TO533:  MOV     #0533,R0                ;LOAD R0 WITH TEST NO.
18572  041354  013701  041402               MOV     @#IO533,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18573  041360  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18574  041364  012704  000377               MOV     #377,R4         ;RESULT S / B = 377
18575  041370  012703  177777               MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
18576  041374  010205                 RO533:  MOV     R2,R5           ;R5 CONTAINS DEST ADDR
18577  041376  005012                         CLR     (R2)            ;[DEST] = 000000
18578  041400  000257                         CCC                     ;SCOPE SYNC
18579
18580  041402  110325                 IO533:  MOVB    R3,(R5)+        ;TEST THE MOVB
18581
18582  041404  020412                         CMP     R4,(R2)         ;RESULT CORRECT ?
18583  041406  001403                         BEQ     00533           ;BR IF YES
18584
18585  041410  011203                         MOV     (R2),R3         ;GET THE WAS DATA
18586  041412  104000                 EO533:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18587  041414  041374                         RO533                   ;ERROR LOOP RETURN ADDRESS
18588
18589  041416  000074                 00533:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
18590
```

```
18591                                   ; ***************************************************************************
18592                                   ;       .SBTTL T0534 MOVB  SM0,DM3 TEST
18593                                   ; ***************************************************************************
18594
18595                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18596
18597                                   ;ROM SEQ:       [173,207,210,203,205,125,375,016] FC 1,4,8
18598
18599                                   ;ACT BUTS:      37[004]100,173  /  22[207]200,203  / 16[125]016,016
18600
18601                                   ;EXEC:          [203]ALUC=LLLLL :[125]D=177777
18602
18603                                   ;CODES:         [125]SPS=3      /      N:C=1000
18604
18605                                   ;SYNC:          BOSJ2   (-)     T=3.4 USEC
18606
18607                                   ;KEY SIG:       K3-3 MOV L  /  K3-6 BYTE INSTR H  /  K3-3 SM=0 L  /  K3-3 DM=3 L
18608
18609  041420  012700  000534          T0534:  MOV     #0534,R0                ;LOAD R0 WITH TEST NO.
18610  041424  013701  041454                  MOV     @#I0534,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18611  041430  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18612  041434  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
18613  041440  012703  177777                  MOV     #-1,R3          ;SOURCE OP IN R3
18614  041444  012705  067576          R0534:  MOV     #ATA+10,R5      ;BASE DEST ADDR = ATA+10
18615  041450  005012                          CLR     (R2)            ;[DEST] = 000000
18616  041452  000257                          CCC                     ;SCOPE SYNC
18617
18618  041454  110335          I0534:  MOVB    R3,@(R5)+       ;TEST THE MOVB
18619
18620  041456  020412                  CMP     R4,(R2)         ;RESULT CORRECT ?
18621  041460  001403                  BEQ     00534           ;BR IF YES
18622
18623  041462  011203                  MOV     (R2),R3         ;GET THE WAS DATA
18624  041464  104000          E0534:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18625  041466  041444                  R0534                   ;ERROR LOOP RETURN ADDRESS
18626
18627  041470  000004          00534:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
18628                                   ; ***************************************************************************
18629                                          .SBTTL T0535 MOVB  SM0,DM4 TEST
18630                                   ; ***************************************************************************
18631
18632                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18633
18634                                   ;ROM SEQ:       [174,257,203,205,125,375,016] FC 1,4,8
18635
18636                                   ;ACT BUTS:      37[004]100,174  /  22[174]200,203  /  16[125]016,016
18637
18638                                   ;EXEC:          [203]ALUC=LLLLL :[125]D=177777
18639
18640                                   ;CODES:         [125]SPS=3       /      N:C=1000
18641
18642                                   ;SYNC:          B05J2   (-)      T=2.6 USEC
18643
18644                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=4 L  /  K3-6 BYTE INSTR H
18645                                                   ;  K5-5 BCON(1+2) H
18646
18647  041472  012700  000535       T0535:  MOV     #0535,R0                ;LOAD R0 WITH TEST NO.
18648  041476  013701  041526               MOV     @#I0535,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18649  041502  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18650  041506  012704  177400               MOV     #177400,R4      ;RESULT S / B = 177400
18651  041512  012703  177777               MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
18652  041516  012705  067604       R0535:  MOV     #MBUF0+2,R5     ;BASE DEST ADDR = MBUF0+2
18653  041522  005012                       CLR     (R2)            ;[DEST] = 000000
18654  041524  000257                       CCC                     ;SCOPE SYNC
18655
18656  041526  110345               I0535:  MOVB    R3,-(R5)        ;TEST THE MOVB
18657
18658  041530  020412                       CMP     R4,(R2)         ;RESULT CORRECT ?
18659  041532  001403                       BEQ     00535           ;BR IF YES
18660
18661  041534  011203                       MOV     (R2),R3         ;GET THE WAS DATA
18662  041536  104000               E0535:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18663  041540  041516                       R0535                   ;ERROR LOOP RETURN ADDRESS
18664
18665  041542  000004               00535:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
18666
```

```
18667                                   ; ***************************************************************
18668                                          .SBTTL T0536 MOVB  SM0,DM6 TEST
18669                                   ; ***************************************************************
18670
18671                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18672
18673                                   ;ROM SEQ:       [176,206,212,203,205,125,375,016] FC 1,4,8
18674
18675                                   ;ACT BUTS:      37[004]100,176  /  17[176]212,212  /  21[206]200,203  /  16[125]016,016
18676
18677                                   ;EXEC:          [203]ALUC=LLLLL :[125]D=177777
18678
18679                                   ;CODES:         [125]SPS=3       /      N:C=1000
18680
18681                                   ;SYNC:          BOSJ2   (-)      T=3 USEC
18682
18683                                   ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=6 L  /  K3-6 BYTE INSTR H
18684                                                   ;  K3-4 OVLAP CYCLE L
18685
18686  041544  012700  000536       T0536:  MOV     #0536,R0                ;LOAD R0 WITH TEST NO.
18687  041550  013701  041600               MOV     @#I0536,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18688  041554  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
18689  041560  012704  000377               MOV     #377,R4         ;RESULT S / B = 377
18690  041564  012703  177777               MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
18691  041570  012705  067604       R0536:  MOV     #MBUF0+2,R5     ;BASE DEST ADDR = MBUF0+2
18692  041574  005012                       CLR     (R2)            ;[DEST] = 000000
18693  041576  000257                       CCC                     ;SCOPE SYNC
18694
18695  041600  110365  177776       I0536:  MOVB    R3,-2(R5)       ;TEST THE MOVB
18696
18697  041604  020412                       CMP     R4,(R2)         ;RESULT CORRECT ?
18698  041606  001403                       BEQ     00536           ;BR IF YES
18699
18700  041610  011203                       MOV     (R2),R3         ;GET THE WAS DATA
18701  041612  104000               E0536:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
18702  041614  041570                       R0536                   ;ERROR LOOP RETURN ADDRESS
18703
18704  041616  000004               00536:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
18705                                   ; ***************************************************************************
18706                                   .SBTTL T0537 BIS TEST - SM0,DM0 - <N:C> = 0111
18707                                   ; ***************************************************************************
18708
18709                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18710
18711                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
18712
18713                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
18714
18715                                   ;EXEC:          [364]ALUC=LLLLH :[360] D = 177777
18716
18717                                   ;CODES:         [360] SPS=3  /  N:C = 1001
18718
18719                                   ;SYNC:          B05J2 (-) T = 1 USEC
18720
18721                                   ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=0L
18722
18723  041620  012700  000537          T0537:  MOV     #0537,R0                ;LOAD R0 WITH TEST NO.
18724  041624  013701  041654                  MOV     @#I0537,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18725  041630  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
18726  041634  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
18727  041640  012705  125252                  MOV     #125252,R5      ;SRC OPR = 125252
18728  041644  012703  052525          R0537:  MOV     #52525,R3       ;[DEST] = 52525
18729  041650  000257                          CCC                     ;CLEAR FLAGS
18730  041652  000267                          267                     ;N:C = 0111
18731
18732  041654  050503                  I0537:  BIS     R5,R3           ;TEST THE BIS
18733
18734  041656  100003                          BPL     E10537          ;N:C = 1001 ?
18735  041660  001402                          BEQ     E10537
18736  041662  102401                          BVS     E10537
18737  041664  103402                          BCS     A0537
18738
18739  041666  104005                  E10537: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
18740  041670  041644                          R0537                   ;ERROR LOOP RETURN ADDRESS
18741
18742  041672  020403                  A0537:  CMP     R4,R3           ;CORRECT RESULT ?
18743  041674  001402                          BEQ     00537           ;BR IF YES
18744
18745  041676  104000                  E20537: ERROR                   ;BIS DELIVERED THE WRONG RESULT
18746  041700  041644                          R0537                   ;ERROR LOOP RETURN ADDRESS
18747
18748  041702  000004                  00537:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18749                                   ; ***************************************************************************
18750                                          .SBTTL T0540 BIS TEST - SM0,DM0 - ‹N:C› = 1000
18751                                   ; ***************************************************************************
18752
18753                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18754
18755                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
18756
18757                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
18758
18759                                   ;EXEC:          [364]ALUC=LLLLH :[360] D = 000000
18760
18761                                   ;CODES:         [360] SPS=3  /  N:C = 0100
18762
18763                                   ;SYNC:          B05J2 (-) T = 1 USEC
18764
18765                                   ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=0L
18766
18767  041704  012700  000540           T0540:  MOV     #0540,R0                ;LOAD R0 WITH TEST NO.
18768  041710  013701  041732                   MOV     @#I0540,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18769  041714  012702  177703                   MOV     #177703,R2      ;DEST ADDR = 177703
18770  041720  005004                           CLR     R4              ;RESULT S / B = 000000
18771  041722  005005                           CLR     R5              ;SRC OPR = 000000
18772  041724  005003           R0540:  CLR     R3              ;[DEST] = 000000
18773  041726  000257                           CCC                     ;CLEAR FLAGS
18774  041730  000270                           SEN                     ;N:C = 1000
18775
18776  041732  050503           I0540:  BIS     R5,R3           ;TEST THE BIS
18777
18778  041734  100403                   BMI     E10540          ;N:C = 0100
18779  041736  001002                   BNE     E10540
18780  041740  102401                   BVS     E10540
18781  041742  103002                   BCC     A0540
18782
18783  041744  104005           E10540: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
18784  041746  041724                   R0540                   ;ERROR LOOP RETURN ADDRESS
18785
18786  041750  020403           A0540:  CMP     R4,R3           ;CORRECT RESULT ?
18787  041752  001402                   BEQ     00540           ;BR IF YES
18788
18789  041754  104000           E20540: ERROR                   ;BIS DELIVERED THE WRONG RESULT
18790  041756  041724                   R0540                   ;ERROR LOOP RETURN ADDRESS
18791
18792  041760  000004           00540:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************************
                                ;       .SBTTL T0541 BIC TEST - SM0,DM0 - <N:C> = 0111
                                ; ***************************************************************************
                                ;
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;
                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8
                                ;
                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
                                ;
                                ;EXEC:          [364]ALUC=HLLHL :[360] D = 100000
                                ;
                                ;CODES:         [360] SPS=3  /  N:C = 1001
                                ;
                                ;SYNC:          B05J2 (-) T = 1 USEC
                                ;
                                ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=0L
                                ;
041762  012700  000541          T0541:  MOV     #0541,R0                ;LOAD R0 WITH TEST NO.
041766  013701  042016                  MOV     @#I0541,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041772  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
041776  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
042002  012705  077777                  MOV     #77777,R5       ;SRC OPR = 77777
042006  012703  177777          R0541:  MOV     #-1,R3          ;[DEST] = 177777
042012  000257                          CCC                     ;CLEAR FLAGS
042014  000267                          SCC                     ;N:C = 0111
                                ;
042016  040503                  I0541:  BIC     R5,R3           ;TEST THE BIC
                                ;
042020  100003                          BPL     E10541          ;N:C = 1001 ?
042022  001402                          BEQ     E10541
042024  102401                          BVS     E10541
042026  103402                          BCS     A0541
                                ;
042030  104005                  E10541: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
042032  042006                          R0541                   ;ERROR LOOP RETURN ADDRESS
                                ;
042034  020403                  A0541:  CMP     R4,R3           ;CORRECT RESULT ?
042036  001402                          BEQ     00541           ;BR IF YES
                                ;
042040  104000                  E20541: ERROR                   ;BIC DELIVERED THE WRONG RESULT
042042  042006                          R0541                   ;ERROR LOOP RETURN ADDRESS
                                ;
042044  000004                  00541:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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18837                                   ; ***************************************************************
18838                                          .SBTTL T0542 BIC TEST - SM0,DM0 - <N:C> = 1000
18839                                   ; ***************************************************************
18840
18841                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18842
18843                                   ;ROM SEQ:       [102,364,360,001] FC 1,7,8
18844
18845                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001
18846
18847                                   ;EXEC:          [364]ALUC=HLLHL :[360] D = 000000
18848
18849                                   ;CODES:         [360] SPS=3  /  N:C = 0100
18850
18851                                   ;SYNC:          B05J2 (-) T = 1 USEC
18852
18853                                   ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=0L
18854
18855  042046  012700  000542          T0542:  MOV     #0542,R0                ;LOAD R0 WITH TEST NO.
18856  042052  013701  042074                  MOV     @#I0542,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18857  042056  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
18858  042062  005004                          CLR     R4              ;RESULT S / B = 000000
18859  042064  005005                          CLR     R5              ;SRC OPR = 000000
18860  042066  005003                  R0542:  CLR     R3              ;[DEST] = 000000
18861  042070  000257                          CCC                     ;CLEAR FLAGS
18862  042072  000270                          SEN                     ;N:C = 1000
18863
18864  042074  040503                  I0542:  BIC     R5,R3           ;TEST THE BIC
18865
18866  042076  100403                          BMI     E10542          ;N:C = 0100
18867  042100  001002                          BNE     E10542
18868  042102  102401                          BVS     E10542
18869  042104  103002                          BCC     A0542
18870
18871  042106  104005                  E10542: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
18872  042110  042066                          R0542                   ;ERROR LOOP RETURN ADDRESS
18873
18874  042112  020403                  A0542:  CMP     R4,R3           ;CORRECT RESULT ?
18875  042114  001402                          BEQ     00542           ;BR IF YES
18876
18877  042116  104000                  E20542: ERROR                   ;BIC DELIVERED THE WRONG RESULT
18878  042120  042066                          R0542                   ;ERROR LOOP RETURN ADDRESS
18879
18880  042122  000004                  00542:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18881                                   ; ***************************************************************************
18882                                          .SBTTL T0543 BIT TEST - SM0,DM0 - <N:C> = 0111
18883                                   ; ***************************************************************************
18884
18885                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18886
18887                                   ;ROM SEQ:       [102,364,362,001] FC 1,7,8
18888
18889                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
18890
18891                                   ;EXEC:          [364]ALUC=HHLHH :[362] D = 100000
18892
18893                                   ;CODES:         [362] SPS=3  /  N:C = 1001
18894
18895                                   ;SYNC:          B05J2 (-) T = 1 USEC
18896
18897                                   ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L
18898                                                   ;  K4-4 ALLOW CLK L
18899
18900  042124  012700  000543        T0543:  MOV     #0543,R0                ;LOAD R0 WITH TEST NO.
18901  042130  013701  042160                MOV     @#I0543,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18902  042134  012702  177703                MOV     #177703,R2      ;DEST ADDR = 177703
18903  042140  012704  100000                MOV     #100000,R4      ;RESULT S / B = 100000
18904  042144  012705  100000                MOV     #100000,R5      ;SRC OPR = 100000
18905  042150  012703  100000        R0543:  MOV     #100000,R3      ;[DEST] = 100000
18906  042154  000257                        CCC                     ;CLEAR FLAGS
18907  042156  000267                        267                     ;N:C = 0111
18908
18909  042160  030503                I0543:  BIT     R5,R3           ;TEST THE BIT
18910
18911  042162  100003                        BPL     E10543          ;N:C = 1001
18912  042164  001402                        BEQ     E10543
18913  042166  102401                        BVS     E10543
18914  042170  103402                        BCS     A0543
18915
18916  042172  104005                E10543: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
18917  042174  042150                        R0543                   ;ERROR LOOP RETURN ADDRESS
18918
18919  042176  020403                A0543:  CMP     R4,R3           ;CORRECT RESULT ?
18920  042200  001403                        BEQ     00543           ;BR IF YES
18921
18922  042202  011203                        MOV     (R2),R3         ;GET THE WAS DATA
18923  042204  104000                E20543: ERROR                   ;BIT DELIVERED A RESULT
18924  042206  042150                        R0543                   ;ERROR LOOP RETURN ADDRESS
18925
18926  042210  000004                00543:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18927                                   ; ***************************************************************************
18928                                          .SBTTL T0544 BIT TEST - SM0,DM0 - <N:C> = 1000
18929                                   ; ***************************************************************************
18930
18931                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18932
18933                                   ;ROM SEQ:       [102,364,362,001] FC 1,7,8
18934
18935                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
18936
18937                                   ;EXEC:          [364]ALUC=HHLHH :[362] D = 000000
18938
18939                                   ;CODES:         [362] SPS=3  /  N:C = 0100
18940
18941                                   ;SYNC:          B05J2 (-) T = 1 USEC
18942
18943                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H
18944                                                   ;  K4-4 ALLOW CLK L
18945
18946  042212  012700  000544          T0544:  MOV     #0544,R0                ;LOAD R0 WITH TEST NO.
18947  042216  013701  042256                  MOV     @#I0544,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18948  042222  032737  002000  066642          BIT     #2000,@#BPTLOC  ;BREAKPOINT HALT SET ??
18949  042230  001401                          BEQ     .+4             ;BR IF NOT
18950  042232  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
18951  042234  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
18952  042240  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
18953  042244  012705  052525                  MOV     #52525,R5       ;SRC OPR = 52525
18954  042250  010403                  R0544:  MOV     R4,R3           ;[DEST] = 125252
18955  042252  000257                          CCC                     ;CLEAR FLAGS
18956  042254  000270                          SEN                     ;N:C = 1000
18957
18958  042256  030503                  I0544:  BIT     R5,R3   ;TEST THE BIT
18959
18960  042260  100403                          BMI     E10544          ;N:C = 0100
18961  042262  001002                          BNE     E10544
18962  042264  102401                          BVS     E10544
18963  042266  103002                          BCC     A0544
18964
18965  042270  104005                  E10544: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
18966  042272  042250                          R0544                   ;ERROR LOOP RETURN ADDRESS
18967
18968  042274  020403                  A0544:  CMP     R4,R3           ;CORRECT RESULT ?
18969  042276  001402                          BEQ     00544           ;BR IF YES
18970
18971  042300  104000                  E20544: ERROR                   ;BIT DELIVERED A RESULT
18972  042302  042250                          R0544                   ;ERROR LOOP RETURN ADDRESS
18973
18974  042304  000004                  00544:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
18975                                   ; ************************************************************************
18976                                          .SBTTL T0545 CMP TEST - SMO,DMO - (N:C) = 0110
18977                                   ; ************************************************************************
18978
18979                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
18980
18981                                   ;ROM SEQ:       [102,364,362,001]FC 1,7,8
18982
18983                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
18984
18985                                   ;EXEC:          [364]ALUC=LLHHL :[362] D = 177777
18986
18987                                   ;CODES:         [362] SPS=3  /  N:C = 1001
18988
18989                                   ;SYNC:          BOSJ2 (-) T = 1 USEC
18990
18991                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 CMP L  /  K3-3 SM=OL  /  K3-3 DM=OL
18992                                                   ;  K3-4 OVLAP INSTR H  /  K4-4 ALLOW CLK L
18993
18994  042306  012700  000545   T0545:  MOV     #0545,R0                ;LOAD R0 WITH TEST NO.
18995  042312  013701  042340           MOV     @#I0545,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
18996  042316  012702  177703           MOV     #177703,R2      ;DEST ADDR = R3
18997  042322  012704  000001           MOV     #+1,R4          ;RESULT S / B = +1
18998  042326  005005                   CLR     R5              ;SRC OPR = 000000
18999  042330  012703  000001   R0545:  MOV     #+1,R3          ;[DEST0546
19000  042334  000257                   CCC                     ;CLEAR FLAGS
19001  042336  000266                   266                     ;N:C = 0110
19002
19003  042340  020503           I0545:  CMP     R5,R3           ;TEST THE CMP
19004
19005  042342  100003                   BPL     E10545          ;N:C = 1001
19006  042344  001402                   BEQ     E10545
19007  042346  102401                   BVS     E10545
19008  042350  103402                   BCS     A0545
19009
19010  042352  104005           E10545: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19011  042354  042330                   R0545                   ;ERROR LOOP RETURN ADDRESS
19012
19013  042356  020403           A0545:  CMP     R4,R3           ;CORRECT RESULT ?
19014  042360  001402                   BEQ     00545           ;BR IF YES
19015
19016  042362  104000           E20545: ERROR                   ;CMP DELIVERED A RESULT
19017  042364  042330                   R0545                   ;ERROR LOOP RETURN ADDRESS
19018
19019  042366  000004           00545:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19020                                   ; ***************************************************************************
19021                                         .SBTTL T0546 CMP TEST - SM0,DM0 - ‹N:C› = 1010
19022                                   ; ***************************************************************************
19023
19024                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19025
19026                                   ;ROM SEQ:       [102,364,362,001] FC 1,7,8
19027
19028                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
19029
19030                                   ;EXEC:          [364]ALUC=LLHHL :[362] D = 000000
19031
19032                                   ;CODES:         [362] SPS=3  /  N:C = 0100
19033
19034                                   ;SYNC:          B05J2 (-) T = 1 USEC
19035
19036                                   ;KEY SIG:       K3-8 CINDO L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=0L
19037                                   ;  K3-4 OVLAP INSTR H  /  K4-4 ALLOW CLK L
19038
19039  042370  012700  000546          T0546:  MOV     #0546,R0                ;LOAD R0 WITH TEST NO.
19040  042374  013701  042422                  MOV     @#I0546,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19041  042400  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
19042  042404  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
19043  042410  012705  177777                  MOV     #-1,R5          ;SRC OPR = 177777
19044  042414  010403                  R0546:  MOV     R4,R3           ;[DEST] = 177777
19045  042416  000257                          CCC                     ;CLEAR FLAGS
19046  042420  000272                          272                     ;N:C = 1010
19047
19048  042422  020503                  I0546:  CMP     R5,R3           ;TEST THE CMP
19049
19050  042424  100403                          BMI     E10546          ;N:C = 0100
19051  042426  001002                          BNE     E10546
19052  042430  102401                          BVS     E10546
19053  042432  103002                          BCC     A0546
19054
19055  042434  104005                  E10546: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19056  042436  042414                          R0546                   ;ERROR LOOP RETURN ADDRESS
19057
19058  042440  020403                  A0546:  CMP     R4,R3           ;CORRECT RESULT ?
19059  042442  001402                          BEQ     00546           ;BR IF YES
19060
19061  042444  104000                  E20546: ERROR                   ;CMP DELIVERED A RESULT
19062  042446  042414                          R0546                   ;ERROR LOOP RETURN ADDRESS
19063
19064  042450  000004                  00546:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19065                                   ; ************************************************************************
19066                                          .SBTTL T0547 CMP TEST - SM0,DM0 - ‹N:C› = 0000
19067                                   ; ************************************************************************
19068
19069                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19070
19071                                   ;ROM SEQ:       [102,364,362,001] FC 1,7,8
19072
19073                                   ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001
19074
19075                                   ;EXEC:          [364]ALUC=LLHHL :[362] D = 077777
19076
19077                                   ;CODES:         [362] SPS=3  /  N:C = 0010
19078
19079                                   ;SYNC:          B05J2 (-) T = 1 USEC
19080
19081                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=0L
19082                                                   ;  K3-4 OVLAP INSTR H  /  K34-4 ALLOW CLK L
19083
19084  042452  012700  000547       T0547:  MOV     #0547,R0                ;LOAD R0 WITH TEST NO.
19085  042456  013701  042504               MOV     @#I0547,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19086  042462  012702  177703               MOV     #177703,R2      ;DEST ADDR = R3
19087  042466  012704  000001               MOV     #+1,R4          ;RESULT S / B = +1
19088  042472  012705  100000               MOV     #100000,R5                      ;SRC OPR = 100000
19089  042476  012703  000001       R0547:  MOV     #+1,R3          ;[DEST0550
19090  042502  000257                       CCC                     ;CLEAR FLAGS
19091
19092  042504  020503               I0547:  CMP     R5,R3           ;TEST THE CMP
19093
19094  042506  100403                       BMI     E10547          ;N:C = 0010
19095  042510  001402                       BEQ     E10547
19096  042512  102001                       BVC     E10547
19097  042514  103002                       BCC     A0547
19098
19099  042516  104005               E10547: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19100  042520  042476                       R0547                   ;ERROR LOOP RETURN ADDRESS
19101
19102  042522  020403               A0547:  CMP     R4,R3           ;CORRECT RESULT ?
19103  042524  001402                       BEQ     00547           ;BR IF YES
19104
19105  042526  104000               E20547: ERROR                   ;CMP DELIVERED A RESULT
19106  042530  042476                       R0547                   ;ERROR LOOP RETURN ADDRESS
19107
19108  042532  000004               00547:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19109                                   ; ***************************************************************************
19110                                          .SBTTL T0550 BIS TEST - SM0,DM1 - <N:C> = 0111
19111                                   ; ***************************************************************************
19112
19113                                   ;MICROPROGRAMMING / LOGIC INFORMATION
19114
19115                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8
19116
19117                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19118
19119                                   ;EXEC:          [224]ALUC=LLLLH :[367] D = 177777
19120
19121                                   ;CODES:         [367] SPS=3  /  N:C = 1001
19122
19123                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
19124
19125                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=1L
19126
19127  042534  012700  000550           T0550:  MOV     #0550,R0                ;LOAD R0 WITH TEST NO.
19128  042540  013701  042570                   MOV     @#I0550,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19129  042544  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19130  042550  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
19131  042554  012705  125252                   MOV     #125252,R5      ;SRC OPR = 125252
19132  042560  012712  052525           R0550:  MOV     #52525,(R2)     ;[DEST] = 52525
19133  042564  000257                           CCC                     ;CLEAR FLAGS
19134  042566  000267                           267                     ;N:C = 0111
19135
19136  042570  050512                   I0550:  BIS     R5,(R2)         ;TEST THE BIS
19137
19138  042572  100003                           BPL     E10550          ;N:C = 1001
19139  042574  001402                           BEQ     E10550
19140  042576  102401                           BVS     E10550
19141  042600  103402                           BCS     A0550
19142
19143  042602  104005                   E10550: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
19144  042604  042560                           R0550                   ;ERROR LOOP RETURN ADDRESS
19145
19146  042606  020412                   A0550:  CMP     R4,(R2)         ;CORRECT RESULT ?
19147  042610  001403                           BEQ     00550           ;BR IF YES
19148
19149  042612  011203                           MOV     (R2),R3         ;GET THE WAS DATA
19150  042614  104000                   E20550: ERROR                   ;BIS DELIVERED THE WRONG RESULT
19151  042616  042560                           R0550                   ;ERROR LOOP RETURN ADDRESS
19152
19153  042620  000004                   00550:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19154                                   ; ***************************************************************************
19155                                          .SBTTL T0551 BIS TEST - SM0,DM1 - (N:C) = 1000
19156                                   ; ***************************************************************************
19157
19158                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19159
19160                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8
19161
19162                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19163
19164                                   ;EXEC:          [224]ALUC=LLLLH :[367] D = 000000
19165
19166                                   ;CODES:         [367] SPS=3  /  N:C = 0100
19167
19168                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
19169
19170                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=1L
19171
19172  042622  012700  000551           T0551:  MOV     #0551,R0                ;LOAD R0 WITH TEST NO.
19173  042626  013701  042650                   MOV     @#I0551,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19174  042632  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19175  042636  005004                           CLR     R4              ;RESULT S / B = 000000
19176  042640  005005                           CLR     R5              ;SRC OPR = 000000
19177  042642  005012           R0551:  CLR     (R2)            ;[DEST] = 000000
19178  042644  000257                           CCC                     ;CLEAR FLAGS
19179  042646  000270                           SEN                     ;N:C = 1000
19180
19181  042650  050512           I0551:  BIS     R5,(R2)         ;TEST THE BIS
19182
19183  042652  100403                   BMI     E10551          ;N:C = 0100
19184  042654  001002                   BNE     E10551
19185  042656  102401                   BVS     E10551
19186  042660  103002                   BCC     A0551
19187
19188  042662  104005           E10551: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
19189  042664  042642                   R0551                   ;ERROR LOOP RETURN ADDRESS
19190
19191  042666  020412           A0551:  CMP     R4,(R2)         ;CORRECT RESULT ?
19192  042670  001403                   BEQ     00551           ;BR IF YES
19193
19194  042672  011203                   MOV     (R2),R3         ;GET THE WAS DATA
19195  042674  104000           E20551: ERROR                   ;BIS DELIVERED THE WRONG RESULT
19196  042676  042642                   R0551                   ;ERROR LOOP RETURN ADDRESS
19197
19198  042700  000004           00551:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19199                                   ; ***************************************************************************
19200                                          .SBTTL T0552 BIC TEST - SM0,DM1 - <N:C> = 0111
19201                                   ; ***************************************************************************
19202
19203                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19204
19205                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8
19206
19207                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19208
19209                                   ;EXEC:          [224]ALUC=HLLHL :[367] D = 100000
19210
19211                                   ;CODES:         [367] SPS=3  /  N:C = 1001
19212
19213                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19214
19215                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=1L
19216
19217  042702  012700  000552           T0552:  MOV     #0552,R0                ;LOAD R0 WITH TEST NO.
19218  042706  013701  042736                   MOV     @#I0552,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19219  042712  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19220  042716  012704  100000                   MOV     #100000,R4      ;RESULT S / B = 100000
19221  042722  012705  077777                   MOV     #77777,R5               ;SRC OPR = 77777
19222  042726  012712  177777           R0552:  MOV     #-1,(R2)        ;[DEST] = 177777
19223  042732  000257                           CCC                     ;CLEAR FLAGS
19224  042734  000267                           267                     ;N:C = 0111
19225
19226  042736  040512                   I0552:  BIC     R5,(R2)         ;TEST THE BIC
19227
19228  042740  100003                           BPL     E10552          ;N:C = 1001
19229  042742  001402                           BEQ     E10552
19230  042744  102401                           BVS     E10552
19231  042746  103402                           BCS     A0552
19232
19233  042750  104005                   E10552: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
19234  042752  042726                           R0552                   ;ERROR LOOP RETURN ADDRESS
19235
19236  042754  020412                   A0552:  CMP     R4,(R2)         ;CORRECT RESULT ?
19237  042756  001403                           BEQ     00552           ;BR IF YES
19238
19239  042760  011203                           MOV     (R2),R3         ;GET THE WAS DATA
19240  042762  104000                   E20552: ERROR                   ;BIC DELIVERED THE WRONG RESULT
19241  042764  042726                           R0552                   ;ERROR LOOP RETURN ADDRESS
19242
19243  042766  000004                   00552:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19244                                   ; ***************************************************************************
19245                                          .SBTTL T0553 BIC TEST - SM0,DM1 - <N:C> = 1000
19246                                   ; ***************************************************************************
19247
19248                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19249
19250                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8
19251
19252                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19253
19254                                   ;EXEC:          [224]ALUC=HLLHL :[367] D = 000000
19255
19256                                   ;CODES:         [367] SPS=3  /  N:C = 0100
19257
19258                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19259
19260                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=1L
19261
19262  042770  012700  000553          T0553:  MOV     #0553,R0                ;LOAD R0 WITH TEST NO.
19263  042774  013701  043016                  MOV     @#I0553,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19264  043000  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19265  043004  005004                          CLR     R4              ;RESULT S / B = 000000
19266  043006  005005                          CLR     R5              ;SRC OPR = 000000
19267  043010  005012          R0553:  CLR     (R2)            ;[DEST] = 000000
19268  043012  000257                          CCC                     ;CLEAR FLAGS
19269  043014  000270                          SEN                     ;N:C = 1000
19270
19271  043016  040512          I0553:  BIC     R5,(R2)         ;TEST THE BIC
19272
19273  043020  100403                          BMI     E10553          ;N:C = 0100
19274  043022  001002                          BNE     E10553
19275  043024  102401                          BVS     E10553
19276  043026  103002                          BCC     A0553
19277
19278  043030  104005          E10553: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
19279  043032  043010                  R0553                   ;ERROR LOOP RETURN ADDRESS
19280
19281  043034  020412          A0553:  CMP     R4,(R2)         ;CORRECT RESULT ?
19282  043036  001403                  BEQ     00553           ;BR IF YES
19283
19284  043040  011203                  MOV     (R2),R3         ;GET THE WAS DATA
19285  043042  104000          E20553: ERROR                   ;BIC DELIVERED THE WRONG RESULT
19286  043044  043010                  R0553                   ;ERROR LOOP RETURN ADDRESS
19287
19288  043046  000004          00553:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19289                                   ; ***************************************************************************
19290                                   .SBTTL T0554 BIT TEST - SM0,DM1 - <N:C> = 0111
19291                                   ; ***************************************************************************
19292
19293                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19294
19295                                   ;ROM SEQ:       [161,266,267,224,367,375,C16] FC 1,3,7,8
19296
19297                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19298
19299                                   ;EXEC:          [224]ALUC=HHLHH :[367] D = 100000
19300
19301                                   ;CODES:         [367] SPS=3  /  N:C = 1001
19302
19303                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19304
19305                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L
19306
19307  043050  012700  000554          T0554:  MOV     #0554,R0                ;LOAD R0 WITH TEST NO.
19308  043054  013701  043104                  MOV     @#I0554,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19309  043060  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19310  043064  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
19311  043070  012705  100000                  MOV     #100000,R5      ;SRC OPR = 100000
19312  043074  012712  100000          R0554:  MOV     #100000,(R2)    ;[DEST] = 100000
19313  043100  000257                          CCC                     ;CLEAR FLAGS
19314  043102  000267                          267                     ;N:C = 0111
19315
19316  043104  030512                  I0554:  BIT     R5,(R2)         ;TEST THE BIT
19317
19318  043106  100003                          BPL     E10554          ;N:C = 1001
19319  043110  001402                          BEQ     E10554
19320  043112  102401                          BVS     E10554
19321  043114  103402                          BCS     A0554
19322
19323  043116  104005                  E10554: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
19324  043120  043074                          R0554                   ;ERROR LOOP RETURN ADDRESS
19325
19326  043122  020412                  A0554:  CMP     R4,(R2)         ;CORRECT RESULT ?
19327  043124  001403                          BEQ     00554           ;BR IF YES
19328
19329  043126  011203                          MOV     (R2),R3         ;GET THE WAS DATA
19330  043130  104000                  E20554: ERROR                   ;BIT DELIVERED A RESULT
19331  043132  043074                          R0554                   ;ERROR LOOP RETURN ADDRESS
19332
19333  043134  000004                  00554:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19334                                   ; ***************************************************************************
19335                                   .SBTTL TO555 BIT TEST - SM0,DM1 - <N:C> = 1000
19336                                   ; ***************************************************************************
19337
19338                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19339
19340                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8
19341
19342                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19343
19344                                   ;EXEC:          [224]ALUC=HHLHH :[367] D = 000000
19345
19346                                   ;CODES:         [367] SPS=3  /  N:C = 0100
19347
19348                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19349
19350                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=1L  /  K4-4 ALLOW CLK L
19351
19352  043136  012700  000555          TO555:  MOV     #0555,R0            ;LOAD R0 WITH TEST NO.
19353  043142  013701  043172                  MOV     @#IO555,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19354  043146  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19355  043152  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
19356  043156  012705  125252                  MOV     #125252,R5      ;SRC OPR = 125252
19357  043162  012712  052525          RO555:  MOV     #52525,(R2)     ;[DEST] = 52525
19358  043166  000257                          CCC                     ;CLEAR FLAGS
19359  043170  000270                          SEN                     ;N:C = 1000
19360
19361  043172  030512                  IO555:  BIT     R5,(R2)         ;TEST THE BIT
19362
19363  043174  100403                          BMI     E10555          ;N:C = 0100
19364  043176  001002                          BNE     E10555
19365  043200  102401                          BVS     E10555
19366  043202  103002                          BCC     A0555
19367
19368  043204  104005          E10555: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
19369  043206  043162                  RO555                   ;ERROR LOOP RETURN ADDRESS
19370
19371  043210  020412          A0555:  CMP     R4,(R2)         ;CORRECT RESULT ?
19372  043212  001403                  BEQ     00555           ;BR IF YES
19373
19374  043214  011203                  MOV     (R2),R3         ;GET THE WAS DATA
19375  043216  104000          E20555: ERROR                   ;BIT DELIVERED A RESULT
19376  043220  043162                  RO555                   ;ERROR LOOP RETURN ADDRESS
19377  043222  000004          00555:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19378                                   ; ***************************************************************************
19379                                          .SBTTL T0556 CMP TEST - SM0,DM1 - <N:C> = 1010
19380                                   ; ***************************************************************************
19381
19382                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19383
19384                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
19385
19386                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19387
19388                                   ;EXEC:          [224]ALUC=LLHHL :[367] D = 000000
19389
19390                                   ;CODES:         [367] SPS=3  /  N:C = 0100
19391
19392                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19393
19394                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
19395                                                   ;  K4-4 ALLOW CLK L
19396
19397  043224  012700  000556           T0556:  MOV     #0556,R0                ;LOAD R0 WITH TEST NO.
19398  043230  013701  043260                   MOV     @#I0556,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19399  043234  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19400  043240  012704  177777                   MOV     #-1,R4          ;RESULT S / B = -1
19401  043244  012705  177777                   MOV     #-1,R5          ;SRC OPR = 177777
19402  043250  012712  177777           R0556:  MOV     #-1,(R2)        ;[DEST] = 177777
19403  043254  000257                           CCC                     ;CLEAR FLAGS
19404  043256  000272                           272                     ;N:C = 1010
19405
19406  043260  020512                   I0556:  CMP     R5,(R2)         ;TEST THE CMP
19407
19408  043262  100403                           BMI     E10556          ;N:C = 0100
19409  043264  001002                           BNE     E10556
19410  043266  102401                           BVS     E10556
19411  043270  103002                           BCC     A0556
19412
19413  043272  104005                   E10556: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19414  043274  043250                           R0556                   ;ERROR LOOP RETURN ADDRESS
19415
19416  043276  020412                   A0556:  CMP     R4,(R2)         ;CORRECT RESULT ?
19417  043300  001403                           BEQ     00556           ;BR IF YES
19418
19419  043302  011203                           MOV     (R2),R3         ;GET THE WAS DATA
19420  043304  104000                   E20556: ERROR                   ;CMP DELIVERED A RESULT
19421  043306  043250                           R0556                   ;ERROR LOOP RETURN ADDRESS
19422
19423  043310  000004                   00556:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19424                                   ; ***************************************************************************
19425                                          .SBTTL T0557 CMP TEST - SM0,DM1 - (N:C) = 0110
19426                                   ; ***************************************************************************
19427
19428                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19429
19430                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
19431
19432                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19433
19434                                   ;EXEC:          [224]ALUC=LLHHL :[367] D = 177777
19435
19436                                   ;CODES:         [367] SPS=3  /  N:C = 1001
19437
19438                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19439
19440                                   ;KEY SIG:       K3-8 CINOO L  /  K3- CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
19441                                                   ;  K4-4 ALLOW CLK L
19442
19443  043312  012700  000557          T0557:  MOV     #0557,R0                ;LOAD R0 WITH TEST NO.
19444  043316  013701  043344                  MOV     @#I0557,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19445  043322  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19446  043326  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
19447  043332  005005                          CLR     R5              ;SRC OPR = 000000
19448  043334  012712  000001          R0557:  MOV     #+1,(R2)        ;[DEST0560
19449  043340  000257                          CCC                     ;CLEAR FLAGS
19450  043342  000266                          266                     ;N:C = 0110
19451
19452  043344  020512                  I0557:  CMP     R5,(R2)         ;TEST THE CMP
19453
19454  043346  100003                          BPL     E10557          ;N:C = 1001
19455  043350  001402                          BEQ     E10557
19456  043352  102401                          BVS     E10557
19457  043354  103402                          BCS     A0557
19458
19459  043356  104005          E10557: ERROR5                          ;CMP FAILED TO ALTER CODES PROPERLY
19460  043360  043334                  R0557                           ;ERROR LOOP RETURN ADDRESS
19461
19462  043362  020412          A0557:  CMP     R4,(R2)         ;CORRECT RESULT ?
19463  043364  001403                  BEQ     00557           ;BR IF YES
19464
19465  043366  011203                  MOV     (R2),R3         ;GET THE WAS DATA
19466  043370  104000          E20557: ERROR                           ;CMP DELIVERED A RESULT
19467  043372  043334                  R0557                           ;ERROR LOOP RETURN ADDRESS
19468
19469  043374  000004          00557:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

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19470                                   ; ***************************************************************
19471                                          .SBTTL T0560 CMP TEST - SM0,DM1 - <N:C> = 0000
19472                                   ; ***************************************************************
19473
19474                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19475
19476                                   ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8
19477
19478                                   ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016
19479
19480                                   ;EXEC:          [224]ALUC=LLHHL :[367] D = 077777
19481
19482                                   ;CODES:         [367] SPS=3  /  N:C = 0010
19483
19484                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19485
19486                                   ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
19487                                                   ;  K4-4 ALLOW CLK L
19488
19489  043376  012700  000560          T0560:  MOV     #0560,R0                ;LOAD R0 WITH TEST NO.
19490  043402  013701  043430                  MOV     @#I0560,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19491  043406  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19492  043412  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
19493  043416  012705  100000                  MOV     #100000,R5      ;SRC OPR = 100000
19494  043422  012712  000001          R0560:  MOV     #+1,(R2)        ;[DEST0561
19495  043426  000257                          CCC                     ;CLEAR FLAGS
19496
19497  043430  020512                  I0560:  CMP     R5,(R2)         ;TEST THE CMP
19498
19499  043432  100403                          BMI     E10560          ;N:C = 0010
19500  043434  001402                          BEQ     E10560
19501  043436  102001                          BVC     E10560
19502  043440  103002                          BCC     A0560
19503
19504  043442  104005                  E10560: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19505  043444  043422                          R0560                   ;ERROR LOOP RETURN ADDRESS
19506
19507  043446  020412                  A0560:  CMP     R4,(R2)         ;CORRECT RESULT ?
19508  043450  001403                          BEQ     00560           ;BR IF YES
19509
19510  043452  011203                          MOV     (R2),R3         ;GET THE WAS DATA
19511  043454  104000                  E20560: ERROR                   ;CMP DELIVERED A RESULT
19512  043456  043422                          R0560                   ;ERROR LOOP RETURN ADDRESS
19513
19514  043460  000004                  00560:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19515                                   ; ***************************************************************************
19516                                          .SBTTL T0561 BIS TEST - SM1,DM0 - (N:C) = 0111
19517                                   ; ***************************************************************************
19518
19519                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19520
19521                                   ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8
19522
19523                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
19524
19525                                   ;EXEC:          [371]ALUC=LLLLH :[360] D = 177777
19526
19527                                   ;CODES:         [360] SPS=3  /  N:C = 1001
19528
19529                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
19530
19531                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1L  /  K3-3 DM=0L
19532
19533  043462  012700  000561          T0561:  MOV     #0561,R0                ;LOAD R0 WITH TEST NO.
19534  043466  013701  043516                  MOV     @#I0561,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19535  043472  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
19536  043476  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
19537  043502  012705  067622                  MOV     #DWTA+10,R5     ;SRC ADDR = DWTA+10
19538  043506  012703  052525          R0561:  MOV     #52525,R3       ;[DEST] = 52525
19539  043512  000257                          CCC                     ;CLEAR FLAGS
19540  043514  000267                          267                     ;N:C = 0111
19541
19542  043516  051503                  I0561:  BIS     (R5),R3         ;TEST THE BIS
19543
19544  043520  100003                          BPL     E10561          ;N:C = 1001
19545  043522  001402                          BEQ     E10561
19546  043524  102401                          BVS     E10561
19547  043526  103402                          BCS     A0561
19548
19549  043530  104005                  E10561: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
19550  043532  043506                          R0561                   ;ERROR LOOP RETURN ADDRESS
19551
19552  043534  020403                  A0561:  CMP     R4,R3           ;CORRECT RESULT ?
19553  043536  001402                          BEQ     00561           ;BR IF YES
19554
19555  043540  104000                  E20561: ERROR                   ;BIS DELIVERED THE WRONG RESULT
19556  043542  043506                          R0561                   ;ERROR LOOP RETURN ADDRESS
19557
19558  043544  000004                  00561:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19559                                   ; ***************************************************************************
19560                                          .SBTTL T0562 BIS TEST - SM1,DM0 - <N:C> = 1000
19561                                   ; ***************************************************************************
19562
19563                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19564
19565                                   ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8
19566
19567                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
19568
19569                                   ;EXEC:          [371]ALUC=LLLLH :[360] D = 000000
19570
19571                                   ;CODES:         [360] SPS=3  /  N:C =0100
19572
19573                                   ;SYNC:          B05J2 (-) T = 2.8 USEC
19574
19575                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1L  /  K3-3 DM=0L
19576
19577  043546  012700  000562           T0562:  MOV     #0562,R0                ;LOAD R0 WITH TEST NO.
19578  043552  013701  043576                   MOV     @#I0562,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19579  043556  012702  177703                   MOV     #177703,R2      ;DEST ADDR = 177703
19580  043562  005004                           CLR     R4              ;RESULT S / B =000000
19581  043564  012705  067612                   MOV     #DWTA,R5        ;SRC ADDR = DWTA
19582  043570  005003                   R0562:  CLR     R3              ;[DEST] = 000000
19583  043572  000257                           CCC                     ;CLEAR FLAGS
19584  043574  000270                           SEN                     ;N:C = 1000
19585
19586  043576  051503                   I0562:  BIS     (R5),R3         ;TEST THE BIS
19587
19588  043600  100403                           BMI     E10562          ;N:C = 0100
19589  043602  001002                           BNE     E10562
19590  043604  102401                           BVS     E10562
19591  043606  103002                           BCC     A0562
19592
19593  043610  104005                   E10562: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
19594  043612  043570                           R0562                   ;ERROR LOOP RETURN ADDRESS
19595
19596  043614  020403                   A0562:  CMP     R4,R3           ;CORRECT RESULT ?
19597  043616  001402                           BEQ     00562           ;BR IF YES
19598
19599  043620  104000                   E20562: ERROR                   ;BIS DELIVERED THE WRONG RESULT
19600  043622  043570                           R0562                   ;ERROR LOOP RETURN ADDRESS
19601
19602  043624  000004                   00562:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19603                                   ; ************************************************************************
19604                                          .SBTTL T0563 BIC TEST - SM1,DM0 - <N:C> = 0111
19605                                   ; ************************************************************************
19606
19607                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19608
19609                                   ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8
19610
19611                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
19612
19613                                   ;EXEC:          [371]ALUC=HLLHL :[360] D = 100000
19614
19615                                   ;CODES:         [360] SPS=3  /  N:C = 1001
19616
19617                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
19618
19619                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1L  /  K3-3 DM=0L
19620
19621  043626  012700  000563           T0563:  MOV     #0563,R0                ;LOAD R0 WITH TEST NO.
19622  043632  013701  043666                   MOV     @#I0563,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19623  043636  012702  177703                   MOV     #177703,R2      ;DEST ADDR = 177703
19624  043642  012704  100000                   MOV     #100000,R4      ;RESULT S / B = 100000
19625  043646  012705  067606                   MOV     #MBUF1,R5       ;SRC ADDR = MBUF1
19626  043652  012703  177777           R0563:  MOV     #-1,R3  ;[DEST] = 177777
19627  043656  012715  077777                   MOV     #77777,(R5)     ;SRC OPR = 77777
19628  043662  000257                           CCC                     ;CLEAR FLAGS
19629  043664  000267                           267                     ;N:C = 0111
19630
19631  043666  041503           I0563:  BIC     (R5),R3         ;TEST THE BIC
19632
19633  043670  100003                   BPL     E10563          ;N:C = 1001 ?
19634  043672  001402                   BEQ     E10563
19635  043674  102401                   BVS     E10563
19636  043676  103402                   BCS     A0563
19637
19638  043700  104005           E10563: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
19639  043702  043652                   R0563                   ;ERROR LOOP RETURN ADDRESS
19640
19641  043704  020403           A0563:  CMP     R4,R3           ;CORRECT RESULT ?
19642  043706  001402                   BEQ     00563           ;BR IF YES
19643
19644  043710  104000           E20563: ERROR                   ;BIC DELIVERED THE WRONG RESULT
19645  043712  043652                   R0563                   ;ERROR LOOP RETURN ADDRESS
19646
19647  043714  000004           00563:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19648                                   ; ***************************************************************************
19649                                           .SBTTL T0564 BIC TEST - SM1,DM0 - (N:C) = 1000
19650                                   ; ***************************************************************************
19651
19652                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19653
19654                                   ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8
19655
19656                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000
19657
19658                                   ;EXEC:          [371]ALUC=HLLHL :[360] D = 000000
19659
19660                                   ;CODES:         [360] SPS=3  /  N:C = 0100
19661
19662                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
19663
19664                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1L  /  K3-3 DM=0L
19665
19666  043716  012700  000564           T0564:  MOV     #0564,R0                ;LOAD R0 WITH TEST NO.
19667  043722  013701  043746                   MOV     @#I0564,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19668  043726  012702  177703                   MOV     #177703,R2      ;DEST ADDR = 177703
19669  043732  005004                           CLR     R4              ;RESULT S / B = 000000
19670  043734  012705  067612                   MOV     #DWTA,R5        ;SRC ADDR = DWTA
19671  043740  005003                   R0564:  CLR     R3              ;[DEST] =000000
19672  043742  000257                           CCC                     ;CLEAR FLAGS
19673  043744  000270                           SEN                     ;N:C = 1000
19674
19675  043746  041503                   I0564:  BIC     (R5),R3         ;TEST THE BIC
19676
19677  043750  100403                           BMI     E10564          ;N:C = 0100
19678  043752  001002                           BNE     E10564
19679  043754  102401                           BVS     E10564
19680  043756  103002                           BCC     A0564
19681
19682  043760  104005                   E10564: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
19683  043762  043740                           R0564                   ;ERROR LOOP RETURN ADDRESS
19684
19685  043764  020403                   A0564:  CMP     R4,R3           ;CORRECT RESULT ?
19686  043766  001402                           BEQ     00564           ;BR IF YES
19687
19688  043770  104000                   E20564: ERROR                   ;BIC DELIVERED THE WRONG RESULT
19689  043772  043740                           R0564                   ;ERROR LOOP RETURN ADDRESS
19690
19691  043774  000004                   00564:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                              .SBTTL T0565 BIT TEST - SM1,DM0 - <N:C> = 0111
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=HHLHH :[362] D = 100000

                                        ;CODES:         [362] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.5 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L

044776  012700  000565        T0565:  MOV     #0565,R0                ;LOAD R0 WITH TEST NO.
044002  013701  044030                MOV     @#I0565,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044006  012702  177703                MOV     #177703,R2      ;DEST ADDR = 177703
044012  012704  100000                MOV     #100000,R4      ;RESULT S / B = 100000
044016  012705  067614                MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
044022  010403        R0565:  MOV     R4,R3                   ;[DEST] = 100000
044024  000257                CCC                             ;CLEAR FLAGS
044026  000267                267                             ;N:C = 0111

044030  031503        I0565:  BIT     (R5),R3                 ;TEST THE BIT

044032  100003                BPL     E10565                  ;N:C = 1001 ?
044034  001402                BEQ     E10565
044036  102401                BVS     E10565
044040  103402                BCS     A0565

044042  104005        E10565: ERROR5                          ;BIT FAILED TO ALTER CODES PROPERLY
044044  044022                R0565                           ;ERROR LOOP RETURN ADDRESS

044046  020403        A0565:  CMP     R4,R3                   ;CORRECT RESULT ?
044050  001402                BEQ     00565                   ;BR IF YES

044052  104000        E20565: ERROR                           ;BIT DELIVERED A RESULT
044054  044022                R0565                           ;ERROR LOOP RETURN ADDRESS

044056  000004        00565:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
19736                                   ; ***************************************************************************
19737                                          .SBTTL T0566 BIT TEST - SM1,DM0 - <N:C> = 1000
19738                                   ; ***************************************************************************
19739
19740                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19741
19742                                   ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8
19743
19744                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000
19745
19746                                   ;EXEC:          [371]ALUC=HHLHH :[362] D = 000000
19747
19748                                   ;CODES:         [362] SPS=3  /  N:C = 0100
19749
19750                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
19751
19752                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L
19753
19754  044060  012700  000566          T0566:  MOV     #0566,R0            ;LOAD R0 WITH TEST NO.
19755  044064  013701  044112                  MOV     @#I0566,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19756  044070  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
19757  044074  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
19758  044100  012705  067622                  MOV     #DWTA+10,R5     ;SRC ADDR = DWTA+10
19759  044104  010403                  R0566:  MOV     R4,R3           ;[DEST] = 52525
19760  044106  000257                          CCC                     ;CLEAR FLAGS
19761  044110  000270                          SEN                     ;N:C = 1000
19762
19763  044112  031503                  I0566:  BIT     (R5),R3         ;TEST THE BIT
19764
19765  044114  100403                          BMI     E10566          ;N:C = 0100
19766  044116  001002                          BNE     E10566
19767  044120  102401                          BVS     E10566
19768  044122  103002                          BCC     A0566
19769
19770  044124  104005                  E10566: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
19771  044126  044104                          R0566                   ;ERROR LOOP RETURN ADDRESS
19772
19773  044130  020403                  A0566:  CMP     R4,R3           ;CORRECT RESULT ?
19774  044132  001402                          BEQ     00566           ;BR IF YES
19775
19776  044134  104000                  E20566: ERROR                   ;BIT DELIVERED A RESULT
19777  044136  044104                          R0566                   ;ERROR LOOP RETURN ADDRESS
19778  044140  000004                  00566:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19779                                   ; ***************************************************************************
19780                                          .SBTTL TO567 CMP TEST - SM1,DM0 - <N:C> = 0110
19781                                   ; ***************************************************************************
19782
19783                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19784
19785                                   ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8
19786
19787                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000
19788
19789                                   ;EXEC:          [371]ALUC=LLHHL :[362] D = 177777
19790
19791                                   ;CODES:         [362] SPS=3  /  N:C = 1001
19792
19793                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19794
19795                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
19796                                                   ;  K4-4 ALLOW CLK L
19797
19798  044142  012700  000567          TO567:  MOV     #0567,R0                ;LOAD R0 WITH TEST NO.
19799  044146  013701  044174                  MOV     @#IO567,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19800  044152  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
19801  044156  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
19802  044162  012705  067612                  MOV     #DWTA,R5        ;SRC ADDR = DWTA
19803  044166  010403                  RO567:  MOV     R4,R3           ;[DEST0570
19804  044170  000257                          CCC                     ;CLEAR FLAGS
19805  044172  000266                          266                     ;N:C = 0110
19806
19807  044174  021503                  IO567:  CMP     (R5),R3         ;TEST THE CMP
19808
19809  044176  100003                          BPL     E10567          ;N:C = 1001
19810  044200  001402                          BEQ     E10567
19811  044202  102401                          BVS     E10567
19812  044204  103402                          BCS     A0567
19813
19814  044206  104005                  E10567: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19815  044210  044166                          RO567                   ;ERROR LOOP RETURN ADDRESS
19816
19817  044212  020403                  A0567:  CMP     R4,R3           ;CORRECT RESULT ?
19818  044214  001402                          BEQ     00567           ;BR IF YES
19819
19820  044216  104000                  E20567: ERROR                   ;CMP DELIVERED A RESULT
19821  044220  044166                          RO567                   ;ERROR LOOP RETURN ADDRESS
19822
19823  044222  000004                  00567:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
 19824                                  ; ***************************************************************************
 19825                                        .SBTTL T0570 CMP TEST - SM1,DM0 - ‹N:C› = 1010
 19826                                  ; ***************************************************************************
 19827
 19828                                  ;MICROPROGRAMMING  /  LOGIC INFORMATION
 19829
 19830                                  ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8
 19831
 19832                                  ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000
 19833
 19834                                  ;EXEC:          [371]ALUC=LLHHL :[362] D = 000000
 19835
 19836                                  ;CODES:         [362] SPS=3  /  N:C = 0100
 19837
 19838                                  ;SYNC:          B05J2 (-) T = 2.7 USEC
 19839
 19840                                  ;KEY SIG:       K3-8 CINOO L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
 19841                                                  ;  K4-4 ALLOW CLK L
 19842
 19843  044224  012700  000570         T0570:  MOV     #0570,R0                ;LOAD R0 WITH TEST NO.
 19844  044230  013701  044256                 MOV     @#I0570,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 19845  044234  012702  177703                 MOV     #177703,R2      ;DEST ADDR = R3
 19846  044240  012704  177777                 MOV     #-1,R4          ;RESULT S / B = 177777
 19847  044244  012705  067614                 MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
 19848  044250  010403                 R0570:  MOV     R4,R3           ;[DEST] = 177777
 19849  044252  000257                         CCC                     ;CLEAR FLAGS
 19850  044254  000272                         272                     ;N:C = 1010
 19851
 19852  044256  021503                 I0570:  CMP     (R5),R3         ;TEST THE CMP
 19853
 19854  044260  100403                         BMI     E10570          ;N:C = 0100
 19855  044262  001002                         BNE     E10570
 19856  044264  102401                         BVS     E10570
 19857  044266  103002                         BCC     A0570
 19858
 19859  044270  104005                 E10570: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
 19860  044272  044250                         R0570                   ;ERROR LOOP RETURN ADDRESS
 19861
 19862  044274  020403                 A0570:  CMP     R4,R3           ;CORRECT RESULT ?
 19863  044276  001402                         BEQ     00570           ;BR IF YES
 19864
 19865  044300  104000                 E20570: ERROR                   ;CMP DELIVERED A RESULT
 19866  044302  044250                         R0570                   ;ERROR LOOP RETURN ADDRESS
 19867
 19868  044304  000004                 00570:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
19869                                   ; ***************************************************************************
19870                                          .SBTTL T0571 CMP TEST - SM1,DM0 - <N:C> = 0000
19871                                   ; ***************************************************************************
19872
19873                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19874
19875                                   ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8
19876
19877                                   ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000
19878
19879                                   ;EXEC:          [371]ALUC=LLHHL :[362] D = 077777
19880
19881                                   ;CODES:         [362] SPS=3  /  N:C = 0010
19882
19883                                   ;SYNC:          B05J2 (-) T = 2.7 USEC
19884
19885                                   ;KEY SIG:       K3-8 CINOO L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
19886                                                   ;  K4-4 ALLOW CLK L
19887
19888  044306  012700  000571          T0571:  MOV     #0571,R0                ;LOAD R0 WITH TEST NO.
19889  044312  013701  044344                  MOV     @#I0571,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19890  044316  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
19891  044322  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
19892  044326  012705  067606                  MOV     #MBUF1,R5       ;SRC ADDR = MBUF1
19893  044332  012703  000001          R0571:  MOV     #+1,R3          ;[DEST0572
19894  044336  012715  100000                  MOV     #100000,(R5)    ;SRC OPR = 100000
19895  044342  000257                          CCC                     ;CLEAR FLAGS
19896
19897  044344  021503                  I0571:  CMP     (R5),R3         ;TEST THE CMP
19898
19899  044346  100403                          BMI     E10571          ;N:C = 0010
19900  044350  001402                          BEQ     E10571
19901  044352  102001                          BVC     E10571
19902  044354  103002                          BCC     A0571
19903
19904  044356  104005                  E10571: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
19905  044360  044332                          R0571                   ;ERROR LOOP RETURN ADDRESS
19906
19907  044362  020403                  A0571:  CMP     R4,R3           ;CORRECT RESULT ?
19908  044364  001402                          BEQ     00571           ;BR IF YES
19909
19910  044366  104000                  E20571: ERROR                   ;CMP DELIVERED A RESULT
19911  044370  044332                          R0571                   ;ERROR LOOP RETURN ADDRESS
19912
19913  044372  000004                  00571:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
 19914                                  ; ***************************************************************
 19915                                        .SBTTL T0572 BIS  SM1,DM1 TEST - <N:C> = 0111
 19916                                  ; ***************************************************************
 19917
 19918                                  ;MICROPROGRAMMING  /  LOGIC INFORMATION
 19919
 19920                                  ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
 19921
 19922                                  ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
 19923
 19924                                  ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
 19925
 19926                                  ;CODES:         [367]SPS=3       /      N:C=1001
 19927
 19928                                  ;SYNC:          B05J2   (-)     T= 3.4 USEC
 19929
 19930                                  ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L
 19931
 19932  044374  012700  000572          T0572:  MOV     #0572,R0                ;LOAD R0 WITH TEST NO.
 19933  044400  013701  044430                  MOV     @#I0572,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 19934  044404  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
 19935  044410  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
 19936  044414  012705  067622                  MOV     #DWTA+10,R5     ;SOURCE ADDR = DWTA+10
 19937  044420  012712  052525          R0572:  MOV     #52525,(R2)     ;[DEST] = 052525
 19938  044424  000257                          CCC                     ;CLEAR FLAGS
 19939  044426  000267                          267                     ;N:C = 0111
 19940
 19941  044430  051512                  I0572:  BIS     (R5),(R2)       ;TEST THE BIS
 19942
 19943  044432  100003                          BPL     E10572          ;N:C = 1001?
 19944  044434  001402                          BEQ     E10572
 19945  044436  102401                          BVS     E10572
 19946  044440  103402                          BCS     A0572
 19947
 19948  044442  104005                  E10572: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
 19949  044444  044420                          R0572                   ;ERROR LOOP RETURN ADDRESS
 19950
 19951  044446  020412                  A0572:  CMP     R4,(R2)         ;CORRECT RESULT ?
 19952  044450  001403                          BEQ     00572           ;BR IF YES
 19953
 19954  044452  011203                          MOV     (R2),R3         ;GET THE WAS DATA
 19955  044454  104000                  E20572: ERROR                   ;BIS DELIVERED THE WRONG RESULT
 19956  044456  044420                          R0572                   ;ERROR LOOP RETURN ADDRESS
 19957
 19958  044460  000004                  00572:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
19959                                   ; ***************************************************************
19960                                          .SBTTL T0573 BIS  SM1,DM1 TEST - <N:C> = 1000
19961                                   ; ***************************************************************
19962
19963                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
19964
19965                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
19966
19967                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
19968
19969                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=000000
19970
19971                                   ;CODES:         [367]SPS=3       /      N:C=0100
19972
19973                                   ;SYNC:          B05J2   (-)      T=3.4 USEC
19974
19975                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L
19976
19977  044462  012700  000573          T0573:  MOV     #0573,R0                ;LOAD R0 WITH TEST NO.
19978  044466  013701  044516                  MOV     @#I0573,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
19979  044472  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
19980  044476  012704  000000                  MOV     #0,R4           ;RESULT S / B = 000000
19981  044502  012705  067612                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
19982  044506  012712  000000          R0573:  MOV     #0,(R2)         ;[DEST] = 000000
19983  044512  000257                          CCC                     ;CLEAR FLAGS
19984  044514  000270                          SEN                     ;N:C = 1000
19985
19986  044516  051512                  I0573:  BIS     (R5),(R2)       ;TEST THE BIS
19987
19988  044520  100403                          BMI     E10573          ;N:C = 0100 ?
19989  044522  001002                          BNE     E10573
19990  044524  102401                          BVS     E10573
19991  044526  103002                          BCC     A0573
19992
19993  044530  104005                  E10573: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
19994  044532  044506                          R0573                   ;ERROR LOOP RETURN ADDRESS
19995
19996  044534  020412                  A0573:  CMP     R4,(R2)         ;CORRECT RESULT ?
19997  044536  001403                          BEQ     00573           ;BR IF YES
19998
19999  044540  011203                          MOV     (R2),R3         ;GET THE WAS DATA
20000  044542  104000                  E20573: ERROR                   ;BIS DELIVERED THE WRONG RESULT
20001  044544  044506                          R0573                   ;ERROR LOOP RETURN ADDRESS
20002
20003  044546  000004                  00573:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20004                                   ; ***************************************************************
20005                                          .SBTTL T0574 BIC  SM1,DM1 TEST - <N:C> = 0111
20006                                   ; ***************************************************************
20007
20008                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20009
20010                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20011
20012                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20013
20014                                   ;EXEC:          [225]ALUC=HLLHL :[367]D=100000
20015
20016                                   ;CODES:         [367]SPS=3       /      N:C=1001
20017
20018                                   ;SYNC:          BOSJ2   (-)     T= 3.4 USEC
20019
20020                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1 L  /  K3-3 DM=1 L
20021
20022  044550  012700  000574          T0574:  MOV     #0574,R0                ;LOAD R0 WITH TEST NO.
20023  044554  013701  044610                  MOV     @#I0574,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20024  044560  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20025  044564  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
20026  044570  012705  067606                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20027  044574  012715  077777          R0574:  MOV     #77777,(R5)     ;[SOURCE] = 77777
20028  044600  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
20029  044604  000257                          CCC                     ;CLEAR FLAGS
20030  044606  000267                          267                     ;N:C = 0111
20031
20032  044610  041512                  I0574:  BIC     (R5),(R2)       ;TEST THE BIC
20033
20034  044612  100003                          BPL     E10574          ;N:C = 1001 ?
20035  044614  001402                          BEQ     E10574
20036  044616  102401                          BVS     E10574
20037  044620  103402                          BCS     A0574
20038
20039  044622  104005                  E10574: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
20040  044624  044574                          R0574                   ;ERROR LOOP RETURN ADDRESS
20041
20042  044626  020412                  A0574:  CMP     R4,(R2)         ;CORRECT RESULT ?
20043  044630  001403                          BEQ     00574           ;BR IF YES
20044
20045  044632  011203                          MOV     (R2),R3         ;GET THE WAS DATA
20046  044634  104000                  E20574: ERROR                   ;BIC DELIVERED THE WRONG RESULT
20047  044636  044574                          R0574                   ;ERROR LOOP RETURN ADDRESS
20048
20049  044640  000004                  00574:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20050                                   ; ***************************************************************
20051                                          .SBTTL T0575 BIC  SM1,DM1 TEST - <N:C> = 1000
20052                                   ; ***************************************************************
20053
20054                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20055
20056                                   ;ROM SEQ:       [141,247,250,162,266,267,225,367,375,016] FC 1,2,3,8
20057
20058                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20059
20060                                   ;EXEC:          [225]ALUC=HLLHL :[367]D=000000
20061
20062                                   ;CODES:         [367]SPS=3       /      N:C=0100
20063
20064                                   ;SYNC:          B05J2   (-)     T= 3.4 USEC
20065
20066                                   ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1 L  /  K3-3 DM=1 L
20067
20068  044642  012700  000575          T0575:  MOV     #0575,R0                ;LOAD R0 WITH TEST NO.
20069  044646  013701  044702                  MOV     @#I0575,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20070  044652  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20071  044656  012704  000000                  MOV     #0,R4           ;RESULT S / B = 000000
20072  044662  012705  067606                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20073  044666  012715  000000          R0575:  MOV     #0,(R5)         ;[SOURCE] = 000000
20074  044672  012712  000000                  MOV     #0,(R2)         ;[DEST] = 000000
20075  044676  000257                          CCC                     ;CLEAR FLAGS
20076  044700  000270                          SEN                     ;N:C = 1000
20077
20078  044702  041512                  I0575:  BIC     (R5),(R2)       ;TEST THE BIC
20079
20080  044704  100403                          BMI     E10575          ;N:C = 0100 ?
20081  044706  001002                          BNE     E10575
20082  044710  102401                          BVS     E10575
20083  044712  103002                          BCC     A0575
20084
20085  044714  104005                  E10575: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
20086  044716  044666                          R0575                   ;ERROR LOOP RETURN ADDRESS
20087
20088  044720  020412                  A0575:  CMP     R4,(R2)         ;CORRECT RESULT ?
20089  044722  001403                          BEQ     00575           ;BR IF YES
20090
20091  044724  011203                          MOV     (R2),R3         ;GET THE WAS DATA
20092  044726  104000                  E20575: ERROR                   ;BIC DELIVERED THE WRONG RESULT
20093  044730  044666                          R0575                   ;ERROR LOOP RETURN ADDRESS
20094
20095  044732  000004                  00575:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20096                                   ; ***************************************************************************
20097                                          .SBTTL T0576 BIT  SM1,DM1 TEST - <N:C> = 1000
20098                                   ; ***************************************************************************
20099
20100                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20101
20102                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20103
20104                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20105
20106                                   ;EXEC:          [225]ALUC=HHLHH :[367]D=000000
20107
20108                                   ;CODES:         [367]SPS=3       /      N:C=0100
20109
20110                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
20111
20112                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
20113
20114  044734  012700  000576           T0576:  MOV     #0576,R0                ;LOAD R0 WITH TEST NO.
20115  044740  013701  044774                   MOV     @#I0576,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20116  044744  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20117  044750  012704  125252                   MOV     #125252,R4      ;RESULT S / B = 125252
20118  044754  012705  067606                   MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20119  044760  012715  052525           R0576:  MOV     #52525,(R5)     ;[SOURCE] = 052525
20120  044764  012712  125252                   MOV     #125252,(R2)    ;[DEST] = 125252
20121  044770  000257                           CCC                     ;CLEAR FLAGS
20122  044772  000270                           SEN                     ;N:C = 1000
20123
20124  044774  031512           I0576:  BIT     (R5),(R2)       ;TEST THE BIT
20125
20126  044776  100403                   BMI     E10576          ;N:C = 0100 ?
20127  045000  001002                   BNE     E10576
20128  045002  102401                   BVS     E10576
20129  045004  103002                   BCC     A0576
20130
20131  045006  104005           E10576: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
20132  045010  044760                   R0576                   ;ERROR LOOP RETURN ADDRESS
20133
20134  045012  020412           A0576:  CMP     R4,(R2)         ;CORRECT RESULT ?
20135  045014  001403                   BEQ     00576           ;BR IF YES
20136
20137  045016  011203                   MOV     (R2),R3         ;GET THE WAS DATA
20138  045020  104000           E20576: ERROR                   ;BIT DELIVERED A RESULT
20139  045022  044760                   R0576                   ;ERROR LOOP RETURN ADDRESS
20140
20141  045024  000004           00576:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20142                                   ; ***************************************************************************
20143                                         .SBTTL T0577 BIT  SM1,DM1 TEST - <N:C> = 0111
20144                                   ; ***************************************************************************
20145
20146                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20147
20148                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20149
20150                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20151
20152                                   ;EXEC:          [225]ALUC=HHLHH :[367]D=100000
20153
20154                                   ;CODES:         [367]SPS=3       /      N:C=1001
20155
20156                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
20157
20158                                   ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
20159
20160  045026  012700  000577          T0577:  MOV     #0577,R0                ;LOAD R0 WITH TEST NO.
20161  045032  013701  045066                  MOV     @#I0577,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20162  045036  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20163  045042  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
20164  045046  012705  067606                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20165  045052  012715  100000          R0577:  MOV     #100000,(R5)    ;[SOURCE] = 100000
20166  045056  012712  100000                  MOV     #100000,(R2)    ;[DEST] = 100000
20167  045062  000257                          CCC                     ;CLEAR FLAGS
20168  045064  000267                          267                     ;N:C = 0111
20169
20170  045066  031512          I0577:  BIT     (R5),(R2)               ;TEST THE BIT
20171
20172  045070  100003                  BPL     E10577                  ;N:C = 1001 ?
20173  045072  001402                  BEQ     E10577
20174  045074  102401                  BVS     E10577
20175  045076  103402                  BCS     A0577
20176
20177  045100  104005          E10577: ERROR5                          ;BIT FAILED TO ALTER CODES PROPERLY
20178  045102  045052                  R0577                           ;ERROR LOOP RETURN ADDRESS
20179
20180  045104  020412          A0577:  CMP     R4,(R2)                 ;CORRECT RESULT ?
20181  045106  001403                  BEQ     00577                   ;BR IF YES
20182
20183  045110  011203                  MOV     (R2),R3                 ;GET THE WAS DATA
20184  045112  104000          E20577: ERROR                           ;BIT DELIVERED A RESULT
20185  045114  045052                  R0577                           ;ERROR LOOP RETURN ADDRESS
20186
20187  045116  000004          00577:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
```

```
20188                                   ; ***************************************************************************
20189                                          .SBTTL T0600 CMP  SM1,DM1 TEST - <N:C> = 1010
20190                                   ; ***************************************************************************
20191
20192                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20193
20194                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20195
20196                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20197
20198                                   ;EXEC:          [225]ALUC=LLHHL :[367]D=000000
20199
20200                                   ;CODES:         [367]SPS=3      /      N:C=0100
20201
20202                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
20203
20204                                   ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
20205                                                   ;  K4-4 ALLOW CLK L
20206
20207  045120  012700  000600           T0600:  MOV     #0600,R0                ;LOAD R0 WITH TEST NO.
20208  045124  013701  045156                   MOV     @#I0600,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20209  045130  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20210  045134  012704  177777                   MOV     #-1,R4          ;RESULT S / B = 177777
20211  045140  012705  067606                   MOV     #MBUF1,R5               ;SOURCE ADDR =
20212  045144  012715  177777           R0600:  MOV     #-1,(R5)        ;[SOURCE] = 177777
20213  045150  010412                           MOV     R4,(R2)         ;[DEST] = 177777
20214  045152  000257                           CCC                     ;CLEAR FLAGS
20215  045154  000272                           272                     ;N:C = 1010
20216
20217  045156  021512           I0600:  CMP     (R5),(R2)       ;TEST THE CMP
20218
20219  045160  100403                           BMI     E10600          ;N:C = 0100 ?
20220  045162  001002                           BNE     E10600
20221  045164  102401                           BVS     E10600
20222  045166  103002                           BCC     A0600
20223
20224  045170  104005           E10600: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
20225  045172  045144                           R0600           ;ERROR LOOP RETURN ADDRESS
20226
20227  045174  020412           A0600:  CMP     R4,(R2)         ;CORRECT RESULT ?
20228  045176  001403                           BEQ     00600           ;BR IF YES
20229
20230  045200  011203                           MOV     (R2),R3         ;GET THE WAS DATA
20231  045202  104000           E20600: ERROR                   ;CMP DELIVERED A RESULT
20232  045204  045144                           R0600           ;ERROR LOOP RETURN ADDRESS
20233
20234  045206  000004           00600:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20235                                   ; ************************************************************************
20236                                         .SBTTL T0601 CMP  SM1,DM1 TEST - <N:C> = 0110
20237                                   ; ************************************************************************
20238
20239                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20240
20241                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20242
20243                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20244
20245                                   ;EXEC:          [225]ALUC=LLHHL :[367]D=177777
20246
20247                                   ;CODES:         [367]SPS=3       /      N:C=1001
20248
20249                                   ;SYNC:          B05J2   (-)     T=3.4 USEC
20250
20251                                   ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
20252                                                   ;  K4-4 ALLOW CLK L
20253
20254  045210  012700  000601          T0601:  MOV     #0601,R0                ;LOAD R0 WITH TEST NO.
20255  045214  013701  045250                  MOV     @#I0601,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20256  045220  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20257  045224  012704  000001                  MOV     #+1,R4          ;RESULT S / B = 000001
20258  045230  012705  067606                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20259  045234  012715  000000          R0601:  MOV     #0,(R5)         ;[SOURCE] = 000000
20260  045240  012712  000001                  MOV     #+1,(R2)        ;[DEST] = 000001
20261  045244  000257                          CCC                     ;CLEAR FLAGS
20262  045246  000266                          266                     ;N:C = 0110
20263
20264  045250  021512          I0601:  CMP     (R5),(R2)       ;TEST THE CMP
20265
20266  045252  100003                  BPL     E10601          ;N:C = 1001 ?
20267  045254  001402                  BEQ     E10601
20268  045256  102401                  BVS     E10601
20269  045260  103402                  BCS     A0601
20270
20271  045262  104005          E10601: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
20272  045264  045234                  R0601                   ;ERROR LOOP RETURN ADDRESS
20273
20274  045266  020412          A0601:  CMP     R4,(R2)         ;CORRECT RESULT ?
20275  045270  001403                  BEQ     00601           ;BR IF YES
20276
20277  045272  011203                  MOV     (R2),R3         ;GET THE WAS DATA
20278  045274  104000          E20601: ERROR                   ;CMP DELIVERED A RESULT
20279  045276  045234                  R0601                   ;ERROR LOOP RETURN ADDRESS
20280
20281  045300  000004          00601:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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20282                                   ; ***************************************************************************
20283                                           .SBTTL T0602 CMP  SM1,DM1 TEST - <N:C> = 0000
20284                                   ; ***************************************************************************
20285
20286                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20287
20288                                   ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8
20289
20290                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016
20291
20292                                   ;EXEC:          [225]ALUC=LLHHL :[367]D=077777
20293
20294                                   ;CODES:         [367]SPS=3      /      N:C=0010
20295
20296                                   ;SYNC:          BOSJ2   (-)     T=3.4 USEC
20297
20298                                   ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
20299                                                   ;  K4-4 ALLOW CLK L
20300
20301  045302  012700  000602           T0602:  MOV     #0602,R0                ;LOAD R0 WITH TEST NO.
20302  045306  013701  045340                   MOV     @#I0602,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20303  045312  012702  067602                   MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20304  045316  012704  000001                   MOV     #+1,R4          ;RESULT S / B = 000001
20305  045322  012705  067606                   MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
20306  045326  012715  100000           R0602:  MOV     #100000,(R5)    ;[SOURCE] = 100000
20307  045332  012712  000001                   MOV     #+1,(R2)        ;[DEST] = 000001
20308  045336  000257                           CCC                     ;N:C = 0000
20309
20310  045340  021512           I0602:  CMP     (R5),(R2)       ;TEST THE CMP
20311
20312  045342  100403                   BMI     E10602          ;N:C = 0010 ?
20313  045344  001402                   BEQ     E10602
20314  045346  102001                   BVC     E10602
20315  045350  103002                   BCC     A0602
20316
20317  045352  104005           E10602: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
20318  045354  045326                   R0602                   ;ERROR LOOP RETURN ADDRESS
20319
20320  045356  020412           A0602:  CMP     R4,(R2)         ;CORRECT RESULT ?
20321  045360  001403                   BEQ     00602           ;BR IF YES
20322
20323  045362  011203                   MOV     (R2),R3         ;GET THE WAS DATA
20324  045364  104000           E20602: ERROR                   ;CMP DELIVERED A RESULT
20325  045366  045326                   R0602                   ;ERROR LOOP RETURN ADDRESS
20326
20327  045370  000004           00602:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
20328
20329
```

```
20330                                   ; ************************************************************************
20331                                          .SBTTL T0603 BISB  SM1,DM0 TEST - SOURCE ADDR ODD
20332                                   ; ************************************************************************
20333
20334                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20335
20336                                   ;ROM SEQ:       [141,247,250,137,251,120,371,360,000] FC 1,2,8
20337
20338                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,120  /  31[120]360,360
20339                                   ;  /  27[371]000,000
20340
20341                                   ;EXEC:          [371]ALUC=LLLLH :[360]D=177777
20342
20343                                   ;CODES:         [360]SPS=3       /      N:C=1000
20344
20345                                   ;SYNC:          B05J2   (-)     T=2.8 USEC
20346
20347                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=0 L  /  K1-6 BADD(1) H
20348                                   ;  K3-7 ODD BYTE H  /  K3-6 BYTE INSTR H
20349
20350  045372  012700  000603          T0603:  MOV     #0603,R0                ;LOAD R0 WITH TEST NO.
20351  045376  013701  045422                  MOV     @#I0603,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20352  045402  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
20353  045406  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
20354  045412  012705  070153          R0603:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20355  045416  005003                          CLR     R3              ;[DEST] = 000000
20356  045420  000257                          CCC                     ;SCOPE SYNC
20357
20358  045422  151503                  I0603:  BISB    (R5),R3         ;TEST THE BISB
20359
20360  045424  020403                          CMP     R4,R3           ;RESULT CORRECT ?
20361  045426  001402                          BEQ     00603           ;BR IF YES
20362
20363  045430  104000                  E0603:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20364  045432  045412                          R0603                   ;ERROR LOOP RETURN ADDRESS
20365
20366  045434  000004                  00603:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
20367
```

```
20368                                   ; ***************************************************************
20369                                           .SBTTL T0604 BISB  SM1,DM1 TEST - SOURCE ADDR ODD
20370                                   ; ***************************************************************
20371
20372                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20373
20374                                   ;ROM SEQ:       [141,247,250,137,251,161,266,267,225,367,375,016] FC 1,2,3,8
20375
20376                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,161  /  33[266]220,225
20377                                   ;  /  16[367]016,016
20378
20379                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20380
20381                                   ;CODES:         [367]SPS=3       /      N:C=1000
20382
20383                                   ;SYNC:          B05J2   (-)     T=3.8 USEC
20384
20385                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
20386                                   ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H
20387
20388  045436  012700  000604          T0604:  MOV     #0604,R0                ;LOAD R0 WITH TEST NO.
20389  045442  013701  045500                  MOV     @#I0604,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20390  045446  032737  004000  066642          BIT     #4000,@#BPTLOC  ;BREAKPOINT HALT SET ??
20391  045454  001401                          BEQ     .+4             ;BR IF NOT
20392  045456  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
20393  045460  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20394  045464  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
20395  045470  012705  070153          R0604:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20396  045474  005012                          CLR     (R2)            ;[DEST] = 000000
20397  045476  000257                          CCC                     ;SCOPE SYNC
20398
20399  045500  151512                  I0604:  BISB    (R5),(R2)       ;TEST THE BISB
20400
20401  045502  020412                          CMP     R4,(R2)         ;CORRECT RESULT
20402  045504  001403                          BEQ     00604           ;BR IF YES
20403
20404  045506  011203                          MOV     (R2),R3         ;GET THE WAS DATA
20405  045510  104000                  E0604:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20406  045512  045470                          R0604                   ;ERROR LOOP RETURN ADDRESS
20407
20408  045514  000004                  00604:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20409                                   ; ***************************************************************************
20410                                          .SBTTL T0605 BISB  SM1,DM2 TEST - SOURCE ADDR ODD
20411                                   ; ***************************************************************************
20412
20413                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20414
20415                                   ;ROM SEQ:       [141,247,250,137,251,162,260,267,225,367,375,016] FC 1,2,3,8
20416
20417                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,162  /  33[260]220,225
20418                                   ;  /  16[367]016,016
20419
20420                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20421
20422                                   ;CODES:         [367]SPS=3       /      N:C=1000
20423
20424                                   ;SYNC:          BOSJ2   (-)     T=3.8 USEC
20425
20426                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=2 L  /  K3-6 BYTE INSTR H
20427                                   ;  /  K1-6 BADO(1) H  /  K3-7 ODD BYTE H  /  K5-5 BCON(1+2) H
20428
20429  045516  012700  000605          T0605:  MOV     #0[05,R0                ;LOAD R0 WITH TEST NO.
20430  045522  013701  045550                  MOV     @#I0605,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20431  045526  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20432  045532  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
20433  045536  012705  070153          R0605:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20434  045542  005012                          CLR     (R2)            ;[DEST] = 000000
20435  045544  010203                          MOV     R2,R3           ;DEST ADDR IN R3
20436  045546  000257                          CCC                     ;SCOPE SYNC
20437
20438  045550  151523          I0605:  BISB    (R5),(R3)+      ;TEST THE BISB
20439
20440  045552  020412                  CMP     R4,(R2)         ;CORRECT RESULT
20441  045554  001403                  BEQ     00605           ;BR IF YES
20442
20443  045556  011203                  MOV     (R2),R3         ;GET THE WAS DATA
20444  045560  104000          E0605:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20445  045562  045536                  R0605                   ;ERROR LOOP RETURN ADDRESS
20446
20447  045564  000004          00605:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20448                                   ; ***************************************************************
20449                                          .SBTTL T0606 BISB  SM1,DM3 TEST - SOURCE ADDR ODD
20450                                   ; ***************************************************************
20451
20452                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20453
20454                                   ;ROM SEQ:       [141,247,250,137,251,163,264,265,266,267,225,367,375,016] FC 1,2,3,8
20455
20456                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,163  /  33[266]220,225
20457                                   ;  /  16[367]016,016
20458
20459                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20460
20461                                   ;CODES:         [367]SPS=3       /      N:C=1000
20462
20463                                   ;SYNC:          B05J2   (-)     T=4.5 USEC
20464
20465                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=3 L  /  K3-6 BYTE INSTR H
20466                                   ;  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H  /  K5-5 BC01 H
20467
20468  045566  012700  000606          T0606:  MOV     #0606,R0                ;LOAD R0 WITH TEST NO.
20469  045572  013701  045622                  MOV     @#I0606,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20470  045576  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20471  045602  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
20472  045606  012705  070153          R0606:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20473  045612  005012                          CLR     (R2)            ;[DEST] = 000000
20474  045614  012703  067576                  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
20475  045620  000257                          CCC                     ;SCOPE SYNC
20476
20477  045622  151533          I0606:  BISB    (R5),@(R3)+     ;TEST THE BISB
20478
20479  045624  020412                  CMP     R4,(R2)         ;CORRECT RESULT
20480  045626  001403                  BEQ     00606           ;BR IF YES
20481
20482  045630  011203                  MOV     (R2),R3         ;GET THE WAS DATA
20483  045632  104000          E0606:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20484  045634  045606                  R0606                   ;ERROR LOOP RETURN ADDRESS
20485
20486  045636  000004          00606:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20487                                   ; ****************************************************************
20488                                           .SBTTL T0607 BISB  SM1,DM4 TEST - SOURCE ADDR ODD
20489                                   ; ****************************************************************
20490
20491                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20492
20493                                   ;ROM SEQ:       [141,247,250,137,251,164,260,267,225,367,375,016] FC 1,2,3,8
20494
20495                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,164  /  33[260]220,225
20496                                   ;  /  16[367]016,016
20497
20498                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20499
20500                                   ;CODES:         [367]SPS=3       /      N:C=1000
20501
20502                                   ;SYNC:          B05J2   (-)     T=3.8 USEC
20503
20504                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=4 L  /  K3-6 BYTE INSTR H
20505                                   ;  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K5-5 BCON(1+2) H
20506
20507  045640  012700  000607          T0607:  MOV     #0607,R0                ;LOAD R0 WITH TEST NO.
20508  045644  013701  045674                  MOV     @#I0607,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20509  045650  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20510  045654  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
20511  045660  012705  070153          R0607:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20512  045664  012703  067604                  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
20513  045670  005012                          CLR     (R2)            ;[DEST] = 000000
20514  045672  000257                          CCC                     ;SCOPE SYNC
20515
20516  045674  151543          I0607:  BISB    (R5),-(R3)      ;TEST THE BISB
20517
20518  045676  020412                  CMP     R4,(R2)         ;CORRECT RESULT
20519  045700  001403                  BEQ     00607           ;BR IF YES
20520
20521  045702  011203                  MOV     (R2),R3         ;GET THE WAS DATA
20522  045704  104000          E0607:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20523  045706  045660                  R0607                   ;ERROR LOOP RETURN ADDRESS
20524
20525  045710  000004          00607:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20526                                ; ***************************************************************
20527                                       .SBTTL T0610 BISB  SM1,DM5 TEST - SOURCE ADDR ODD
20528                                ; ***************************************************************
20529
20530                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
20531
20532                                ;ROM SEQ:       [141,247,250,137,251,165,264,265,266,267,225,367,375,016] FC 1,2,3,8
20533
20534                                ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,165  /  33[266]220,225
20535                                ;  /  16[367]016,016
20536
20537                                ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20538
20539                                ;CODES:         [367]SPS=3       /      N:C=1000
20540
20541                                ;SYNC:          BO5J2   (-)     T= 4.5 USEC
20542
20543                                ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=5 L  /  K3-6 BYTE INSTR H
20544                                ;  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K5-5 BC01 H
20545
20546  045712  012700  000610       T0610:  MOV     #0610,R0                ;LOAD R0 WITH TEST NO.
20547  045716  013701  045746               MOV     @#I0610,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20548  045722  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20549  045726  012704  000377               MOV     #377,R4         ;RESULT S / B = 377
20550  045732  012705  070153       R0610:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20551  045736  012703  067600               MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
20552  045742  005012                       CLR     (R2)            ;[DEST] = 000000
20553  045744  000257                       CCC                     ;SCOPE SYNC
20554
20555  045746  151553       I0610:  BISB    (R5),@-(R3)     ;TEST THE BISB
20556
20557  045750  020412                       CMP     R4,(R2)         ;CORRECT RESULT
20558  045752  001403                       BEQ     00610           ;BR IF YES
20559
20560  045754  011203                       MOV     (R2),R3         ;GET THE WAS DATA
20561  045756  104000       E0610:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20562  045760  045732                       R0610           ;ERROR LOOP RETURN ADDRESS
20563
20564  045762  000004       00610:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20565                                   ; ***************************************************************
20566                                          .SBTTL T0611 BISB  SM1,DM6 TEST - SOURCE ADDR ODD
20567                                   ; ***************************************************************
20568
20569                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20570
20571                                   ;ROM SEQ:       [141,247,250,137,251,167,261,262,266,267,225,367,375,016] FC 1,2,3,8
20572
20573                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,167  /  17[167]262,262
20574                                   ;  /  33[266]220,225  /  16[367]016,016
20575
20576                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20577
20578                                   ;CODES:         [367]SPS=3       /      N:C=1000
20579
20580                                   ;SYNC:          B05J2   (-)     T=4.6 USEC
20581
20582                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=6 L  /  K3-6 BYTE INSTR H
20583                                   ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H
20584
20585  045764  012700  000611      T0611:  MOV     #0611,R0                ;LOAD R0 WITH TEST NO.
20586  045770  013701  046020              MOV     @#I0611,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20587  045774  012702  067602              MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20588  046000  012704  000377              MOV     #377,R4         ;RESULT S / B = 377
20589  046004  012705  070153      R0611:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20590  046010  012703  067610              MOV     #MBUF0+6,R3     ;BASE DEST ADDR = MBUF0+6
20591  046014  005012                      CLR     (R2)            ;[DEST] = 000000
20592  046016  000257                      CCC                     ;SCOPE SYNC
20593
20594  046020  151563  177772      I0611:  BISB    (R5),-6(R3)     ;TEST THE BISB
20595
20596  046024  020412                      CMP     R4,(R2)         ;CORRECT RESULT
20597  046026  001403                      BEQ     00611           ;BR IF YES
20598
20599  046030  011203                      MOV     (R2),R3         ;GET THE WAS DATA
20600  046032  104000              E0611:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20601  046034  046004                      R0611                   ;ERROR LOOP RETURN ADDRESS
20602
20603  046036  000004              00611:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20604                                   ; ****************************************************************
20605                                           .SBTTL T0612 BISB  SM1,DM7 TEST - SOURCE ADDR ODD
20606                                   ; ****************************************************************
20607
20608                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20609
20610                                   ;ROM SEQ:       [141,247,250,137,251,167,261,263,264,265,266,267,225,367,375,016] FC 1,2
20611
20612                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,167  /  17[167]262,263
20613                                   ;  /  33[266]220,225  /  16[367]016,016
20614
20615                                   ;EXEC:          [225]ALUC=LLLLH :[367]D=177777
20616
20617                                   ;CODES:         [367]SPS=3       /      N:C=1000
20618
20619                                   ;SYNC:          B05J2   (-)     T=5.2 USEC
20620
20621                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=7 L  / K3-6 BYTE INSTR H
20622                                   ;  K3-7 ODD BYTE H  /  K1-6 BADD(1) H
20623
20624  046040  012700  000612       T0612:  MOV     #0612,R0                ;LOAD R0 WITH TEST NO.
20625  046044  013701  046074               MOV     @#I0612,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20626  046050  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20627  046054  012704  000377               MOV     #377,R4         ;RESULT S / B = 377
20628  046060  012705  070153       R0612:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20629  046064  012703  067566               MOV     #ATA,R3         ;BASE DEST ADDR = ATA
20630  046070  005012                       CLR     (R2)            ;[DEST] = 000000
20631  046072  000257                       CCC                     ;SCOPE SYNC
20632
20633  046074  151573  000010       I0612:  BISB    (R5),@10(R3)    ;TEST THE BISB
20634
20635  046100  020412                       CMP     R4,(R2)         ;CORRECT RESULT
20636  046102  001403                       BEQ     00612           ;BR IF YES
20637
20638  046104  011203                       MOV     (R2),R3         ;GET THE WAS DATA
20639  046106  104000               E0612:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20640  046110  046060                       R0612                   ;ERROR LOOP RETURN ADDRESS
20641
20642  046112  000004               00612:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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20643                                   ; ***************************************************************************
20644                                          .SBTTL TO613 BISB  SM0,DM2 TEST - DEST ADDR EVEN
20645                                   ; ***************************************************************************
20646
20647                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20648
20649                                   ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8
20650
20651                                   ;ACT BUTS:      37[004]100,162  /  33[260]220,224  /  16[367]016,016
20652
20653                                   ;EXEC:          [224]ALUC=LLLLH :[367]D=000377
20654
20655                                   ;CODES:         [367]SPS=3       /  N:C=1000
20656
20657                                   ;SYNC:          B05J2   (-)     T=2.7 USEC
20658
20659                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
20660                                   ;  K5-5 BCON(1+2) H
20661
20662  046114  012700  000613      TO613:  MOV     #0613,R0                ;LOAD R0 WITH TEST NO.
20663  046120  013701  046142              MOV     @#IO613,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20664  046124  012702  067602              MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20665  046130  012704  000377              MOV     #377,R4         ;RESULT S / B = 377
20666  046134  010203              RO613:  MOV     R2,R3           ;DEST ADDR IN R3
20667  046136  005012                      CLR     (R2)            ;[DEST] = 000000
20668  046140  000257                      CCC                     ;SCOPE SYNC
20669
20670  046142  150423              IO613:  BISB    R4,(R3)+        ;TEST THE BISB
20671
20672  046144  020412                      CMP     R4,(R2)         ;CORRECT RESULT
20673  046146  001403                      BEQ     OO613           ;BR IF YES
20674
20675  046150  011203                      MOV     (R2),R3         ;GET THE WAS DATA
20676  046152  104000              EO613:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20677  046154  046134                      RO613                   ;ERROR LOOP RETURN ADDRESS
20678
20679  046156  000004              OO613:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20680                                   ; ***************************************************************************
20681                                          .SBTTL T0614 BISB  SM0,DM1 TEST - DEST ADDR ODD
20682                                   ; ***************************************************************************
20683
20684                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20685
20686                                   ;ROM SEQ:       [161,266,267,237,270,230,254,074,366,375,016] FC 1,3,8
20687
20688                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,237  /  34[237]220,230  /  16[366]016,016
20689
20690                                   ;EXEC:          [230]ALUC=LLLLH :[375]D=177777
20691
20692                                   ;CODES:         [254]SPS=1,[074]SPS=3    /      N:C=1000
20693
20694                                   ;SYNC:          B05J2   (-)     T=3 USEC
20695
20696                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
20697                                                   ;  K3-7 ODD BYTE H  /  K1-6 BADD(1) H
20698
20699  046160  012700  000614       T0614:  MOV     #0614,R0                ;LOAD R0 WITH TEST NO.
20700  046164  013701  046214               MOV     @#I0614,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20701  046170  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20702  046174  012704  177400               MOV     #177400,R4      ;RESULT S / B = 177400
20703  046200  012705  000377               MOV     #377,R5         ;[R5]=SOURCE OPR = 377
20704  046204  012703  067603       R0614:  MOV     #MBUF0+1,R3     ;ODD DEST ADDR IN R3
20705  046210  005012                       CLR     (R2)            ;[DEST] = 000000
20706  046212  000257                       CCC                     ;SCOPE SYNC
20707
20708  046214  150513               I0614:  BISB    R5,(R3)         ;TEST THE BISB
20709
20710  046216  020412                       CMP     R4,(R2)         ;CORRECT RESULT
20711  046220  001403                       BEQ     00614           ;BR IF YES
20712
20713  046222  011203                       MOV     (R2),R3         :GET THE WAS DATA
20714  046224  104000               E0614:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20715  046226  046204                       R0614                   ;ERROR LOOP RETURN ADDRESS
20716
20717  046230  000004               00614:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20718                                   ; ***************************************************************************
20719                                          .SBTTL T0615 BISB  SM0,DM1 TEST - DEST ADDR EVEN
20720                                   ; ***************************************************************************
20721
20722                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20723
20724                                   ;ROM SEQ:       [161,266,257,224,367,375,016] FC 1,3,8
20725
20726                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016
20727
20728                                   ;EXEC:          [224]ALUC=LLLLH :[367]D=000377
20729
20730                                   ;CODES:         [367]SPS=3       /      N:C=1000
20731
20732                                   ;SYNC:          B05J2   (-)     T=2.6 USEC
20733
20734                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
20735
20736  046232  012700  000615          T0615:  MOV     #0615,R0                ;LOAD R0 WITH TEST NO.
20737  046236  013701  046260                  MOV     @#I0615,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20738  046242  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20739  046246  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
20740  046252  010203                  R0615:  MOV     R2,R3           ;DEST ADDR IN R3
20741  046254  005012                          CLR     (R2)            ;[DEST] = 000000
20742  046256  000257                          CCC                     ;SCOPE SYNC
20743
20744  046260  150413                  I0615:  BISB    R4,(R3)         ;TEST THE BISB
20745
20746  046262  020412                          CMP     R4,(R2)         ;CORRECT RESULT
20747  046264  001403                          BEQ     00615           ;BR IF YES
20748
20749  046266  011203                          MOV     (R2),R3         ;GET THE WAS DATA
20750  046270  104000                  E0615:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20751  046272  046252                          R0615                   ;ERROR LOOP RETURN ADDRESS
20752
20753  046274  000004                  00615:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20754                                   ; ***************************************************************************
20755                                          .SBTTL T0616 BISB  SM1,DM1 TEST - DEST ADDR ODD
20756                                   ; ***************************************************************************
20757
20758                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20759
20760                                   ;ROM SEQ:       [141,247,250,137,251,161,266,257,237,270,231,254,074,366,375,016] FC 1,2
20761
20762                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,161  /  33[266]220,237
20763                                   ;  /  34[237]220,231  /  16[366]016,016
20764
20765                                   ;EXEC:          [231]ALUC=LLLLH :[375]D=177777
20766
20767                                   ;CODES:         [254]SPS=1,[074]SPS=3    /      N:C=1000
20768
20769                                   ;SYNC:          BOSJ2   (-)     T=4.2 USEC
20770
20771                                   ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
20772                                   ;  K3-7 ODD BYTE H  /  K1-6 BADD(1) H
20773
20774  046276  012700  000616       T0616:  MOV     #0616,R0                ;LOAD R0 WITH TEST NO.
20775  046302  013701  046332               MOV     @#I0616,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20776  046306  012702  067602               MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
20777  046312  012704  177400               MOV     #177400,R4      ;RESULT S / B = 177400
20778  046316  012705  070153       R0616:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
20779  046322  012703  067603               MOV     #MBUF0+1,R3     ;ODD DEST ADDR IN R3
20780  046326  005012                       CLR     (R2)            ;[DEST] = 000000
20781  046330  000257                       CCC                     ;SCOPE SYNC
20782
20783  046332  151513               I0616:  BISB    (R5),(R3)       ;TEST THE BISB
20784
20785  046334  020412                       CMP     R4,(R2)         ;CORRECT RESULT
20786  046336  001403                       BEQ     00616           ;BR IF YES
20787
20788  046340  011203                       MOV     (R2),R3         ;GET THE WAS DATA
20789  046342  104000               E0616:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
20790  046344  046316                       R0616                   ;ERROR LOOP RETURN ADDRESS
20791
20792  046346  000004               00616:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
20793                                   ; ***************************************************************
20794                                         .SBTTL T0617 JMP MODE 1 TEST, FLAGS = 1111
20795                                   ; ***************************************************************
20796
20797                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20798
20799                                   ;ROM SEQ:       [151,300,306,313,016] FC 1,5
20800
20801                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,306 / 16[306]016,016
20802
20803                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0617
20804
20805                                   ;CODES:         N:C = 1111 (NO CHANGE)
20806
20807                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
20808
20809                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
20810
20811  046350  012700  000617          T0617:  MOV     #0617,R0                ;LOAD R0 WITH TEST NO.
20812  046354  013701  046366                  MOV     @#I0617,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20813
20814  046360  012702  046376          R0617:  MOV     #A0617,R2               ;R2 CONTAINS JUMP ADDRESS
20815  046364  000277                          SCC                     ;MAKE N:C = 1111
20816
20817  046366  000112                  I0617:  JMP     (R2)            ;TEST THE JMP - GO TO A0617
20818
20819  046370  104006                  E10617: ERROR6                  ;JMP FAILED TO LOAD PC
20820  046372  046360                          R0617                   ;ERROR LOOP RETURN
20821  046374  000406                          BR      00617           ;GO CALL SCOPE
20822
20823  046376  103003                  A0617:  BCC     E20617          ;BR IF JMP CLEARED "C"
20824  046400  102002                          BVC     E20617          ;BR IF JMP CLEARED "V"
20825  046402  001001                          BNE     E20617          ;BR IF JMP CLEARED "Z"
20826  046404  100402                          BMI     00617           ;BR IF "N" STILL SET
20827
20828  046406  104006                  E20617: ERROR6                  ;JMP ALTERED CODES - CLEARED ONE
20829  046410  046360                          R0617                   ;ERROR LOOP RETURN
20830
20831  046412  000004                   00617: SCOPE                   ;CALL SCOPE LOOP UTILITY
20832
20833
```

```
20834                                   ; ***************************************************************************
20835                                   ;       .SBTTL T0620 JMP MODE 1 TEST, FLAGS = 0000
20836                                   ; ***************************************************************************
20837
20838                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20839
20840                                   ;ROM SEQ:       [151,300,306,313,016] FC 1,5
20841
20842                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,306 / 16[306]016,016
20843
20844                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0620
20845
20846                                   ;CODES:         N:C = 0000 (NO CHANGE)
20847
20848                                   ;SYNC:          B05J2 (-) T = 1.8 USEC
20849
20850                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
20851
20852  046414  012700  000620          T0620:  MOV     #0620,R0                ;LOAD R0 WITH TEST NO.
20853  046420  013701  046432                  MOV     @#I0620,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20854
20855  046424  012702  046442          R0620:  MOV     #A0620,R2               ;R2 CONTAINS JMP ADDRESS
20856  046430  000257                          CCC                     ;MAKE N:C = 0000
20857
20858  046432  000112                  I0620:  JMP     (R2)            ;TEST THE JMP - GO TO A0620
20859
20860  046434  104006                  E10620: ERROR6                  ;JMP FAILED TO LOAD PC
20861  046436  046424                          R0620                   ;ERROR LOOP RETURN
20862  046440  000406                          BR      00620           ;GO CALL SCOPE
20863
20864  046442  103403                  A0620:  BCS     E20620          ;BR IF JMP SET "C"
20865  046444  102402                          BVS     E20620          ;BR IF JMP SET "V"
20866  046446  001401                          BEQ     E20620          ;BR IF JMP SET "Z"
20867  046450  100002                          BPL     00620           ;BR IF "N" STILL CLEAR
20868
20869  046452  104006                  E20620: ERROR6                  ;JMP ALTERED CODES - SET ONE
20870  046454  046424                          R0620                   ;ERROR LOOP RETURN
20871
20872  046456  000004                   00620: SCOPE                   ;CALL SCOPE LOOP UTILITY
20873
20874
```

```
20875                                   ; ***************************************************************
20876                                           .SBTTL T0621 JMP MODE 2 TEST; FLAGS = 1111
20877                                   ; ***************************************************************
20878  046460  012700  000621          T0621:  MOV     #0621,R0                ;LOAD R0 WITH TEST NO.
20879                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20880
20881                                   ;ROM SEQ:       [152,235,300,306,313,016] FC 1,5
20882
20883                                   ;ACT BUTS:      37[004]100,152 / 15[235]306,306 / 16[306]016,016
20884
20885                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0621
20886
20887                                   ;CODES:         N:C = 1111 (NO CHANGE)
20888
20889                                   ;SYNC:          B05J2 (-) T = 2.1 USEC
20890
20891                                   ;KEY SIG:       K3-3 DM=2L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
20892
20893  046464  013701  046476                  MOV     @#I0621,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20894
20895  046470  012702  046506          R0621:  MOV     #A0621,R2               ;R2 CONTAINS JUMP ADDRESS
20896  046474  000277                          SCC                             ;SET N:C = 1111
20897
20898  046476  000122                  I0621:  JMP     (R2)+                   ;TEST THE JMP - GO TO A0621
20899
20900  046500  104006                  E10621: ERROR6                          ;JMP FAILED TO LOAD PC
20901  046502  046470                          R0621                           ;ERROR LOOP RETURN
20902  046504  000413                          BR      00621                   ;GO TO SCOPE EXIT
20903
20904  046506  103003                  A0621:  BCC     E20621                  ;BR IF JMP CLEARED "C"
20905  046510  102002                          BVC     E20621                  ;BR IF JMP CLEARED "V"
20906  046512  001001                          BNE     E20621                  ;BR IF JMP CLEARED "Z"
20907  046514  100402                          BMI     B0621                   ;BR IF "N" STILL SET
20908
20909  046516  104006                  E20621: ERROR6                          ;JMP ALTERED CODES - CLEARED
20910  046520  046470                          R0621                           ;ERROR LOOP RETURN
20911
20912  046522  022702  046510          B0621:  CMP     #A0621+2,R2             ;DID R2 GET AUTO-INCREMENTED?
20913  046526  001402                          BEQ     00621                   ;BR IF YES
20914
20915  046530  104006                  E30621: ERROR6                          ;JMP FAILED TO UPDATE REGISTER (R2)
20916  046532  046470                          R0621                           ;ERROR LOOP RETURN
20917
20918  046534  000004                   00621: SCOPE                           ;CALL SCOPE LOOP UTILITY
20919
20920
```

```
20921                                   ; ***************************************************************************
20922                                   .SBTTL T0622 JMP MODE 2 TEST; FLAGS = 0000
20923                                   ; ***************************************************************************
20924
20925                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20926
20927                                   ;ROM SEQ:       [152,235,300,306,313,016] FC 1,5
20928
20929                                   ;ACT BUTS:      37[004]100,152 / 15[235]306,306 / 16[306]016,016
20930
20931                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0622
20932
20933                                   ;CODES:         N:C = 0000 (NO CHANGE)
20934
20935                                   ;SYNC:          B05J2 (-) T = 2.1 USEC
20936
20937                                   ;KEY SIG:       K3-3 DM=2L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
20938
20939  046536  012700  000622           T0622:  MOV     #0622,R0                ;LOAD R0 WITH TEST NO.
20940  046542  013701  046554                   MOV     @#I0622,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20941
20942  046546  012702  046564           R0622:  MOV     #A0622,R2               ;R2 CONTAINS JUMP ADDRESS
20943  046552  000257                           CCC                     ;MAKE N:C = 0000
20944
20945  046554  000122                   I0622:  JMP     (R2)+           ;TEST THE JMP - GO TO A0622
20946
20947  046556  104006                   E10622: ERROR6                  ;JMP FAILED TO LOAD PC
20948  046560  046546                           R0622                   ;ERROR LOOP RETURN
20949  046562  000406                           BR      00622           ;GO TO SCOPE EXIT
20950
20951  046564  103403                   A0622:  BCS     E20622          ;BR IF JMP SET "C"
20952  046566  102402                           BVS     E20622          ;BR IF JMP SET "V"
20953  046570  001401                           BEQ     E20622          ;BR IF JMP SET "Z"
20954  046572  100002                           BPL     00622           ;BR IF "N" IS CLEAR
20955
20956  046574  104006                   E20622: ERROR6                  ;JMP ALTERED CODES - SET
20957  046576  046546                           R0622                   ;ERROR LOOP RETURN
20958
20959  046600  000004                    00622: SCOPE                   ;CALL SCOPE LOOP UTILITY
20960
20961
```

```
20962                                   ; ***************************************************************************
20963                                          .SBTTL T0623 JMP TEST MODE 3; FLAGS = 1111
20964                                   ; ***************************************************************************
20965
20966                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
20967
20968                                   ;ROM SEQ:       [153,303,306,313,016] FC 1,5
20969
20970                                   ;ACT BUTS:      37[004]100,153 / 15[153]306,306 / 16[306]016,016
20971
20972                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0623
20973
20974                                   ;CODES:         N:C = 1111 (NO CHANGE)
20975
20976                                   ;SYNC:          B05J2 (-) T = 2.3 USEC
20977
20978                                   ;KEY SIG:       K3-3 DM=3L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
20979
20980  046602  012700  000623           T0623:  MOV     #0623,R0                ;LOAD R0 WITH TEST NO.
20981  046606  013701  046620                   MOV     @#I0623,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
20982
20983  046612  012702  046660           R0623:  MOV     #JMP3,R2        ;R2 CONTAINS ADDRESS OF JUMP ADDRESS
20984  046616  000277                           SCC                     ;SET N:C = 1111
20985
20986  046620  000132                   I0623:  JMP     @(R2)+          ;TEST THE JMP - GO TO A0623
20987
20988  046622  104006                   E10623: ERROR6                  ;JMP FAILED TO LOAD PC
20989  046624  046612                           R0623                   ;ERROR LOOP RETURN
20990  046626  000417                           BR      00623           ;GO TO SCOPE EXIT
20991
20992  046630  103003                   A0623:  BCC     E20623          ;BR IF JMP CLEARED "C"
20993  046632  102002                           BVC     E20623          ;BR IF JMP CLEARED "V"
20994  046634  001001                           BNE     E20623          ;BR IF JMP CLEARED "Z"
20995  046636  100402                           BMI     B0623           ;BR IF "N" STILL SET
20996
20997  046640  104006                   E20623: ERROR6                  ;JMP ALTERED CODES - CLEAR
20998  046642  046612                           R0623                   ;ERROR LOOP RETURN
20999
21000  046644  022702  046662           B0623:  CMP     #JMP3+2,R2      ;DID JMP UPDATE R2?
21001  046650  001406                           BEQ     00623           ;BR IF YES
21002
21003  046652  104006                   E30623: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
21004  046654  046612                           R0623                   ;ERROR LOOP RETURN
21005  046656  000403                           BR      00623           ;GO TO SCOPE EXIT
21006  046660  046630                   JMP3:   A0623                   ;JMP3 CONTAINS JUMP ADDRESS
21007  046662  104006                   E40623: ERROR6                  ;ERROR CALL OCCURS IF MODE3 HAPPENS
21008  046664  046612                           R0623                   ;ERROR LOOP RETURN
21009                                                                   ;TO EXECUTE AS MODE 1 OR 2 AND
21010                                                                   ;A0623 IS LEGAL INSTRUCTION
21011
21012  046666  000004                    00623: SCOPE                   ;CALL SCOPE LOOP UTILITY
21013
21014
```

```
21015                                   ; ***************************************************************
21016                                          .SBTTL T0624 JMP TEST MODE 3; FLAGS = 0000
21017                                   ; ***************************************************************
21018
21019                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21020
21021                                   ;ROM SEQ:       [153,303,306,313,016] FC 1,5
21022
21023                                   ;ACT BUTS:      37[004]100,153 / 15[153]306,306 / 16[306]016,016
21024
21025                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0624
21026
21027                                   ;CODES:         N:C = 0000 (NO CHANGE)
21028
21029                                   ;SYNC:          B05J2 (-) T = 2.3 USEC
21030
21031                                   ;KEY SIG:       K3-3 DM=3L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21032
21033  046670  012700  000624           T0624:  MOV     #0624,R0                ;LOAD R0 WITH TEST NO.
21034  046674  013701  046706                   MOV     @#I0624,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21035
21036  046700  012702  046734           R0624:  MOV     #JMP3A,R2       ;R2 CONTAINS ADDRESS OF JUMP ADDRESS
21037  046704  000257                           CCC                     ;MAKE N:C = 0000
21038
21039  046706  000132                   I0624:  JMP     @(R2)+          ;TEST THE JMP - GO TO A0624
21040
21041  046710  104006                   E10624: ERROR6                  ;JMP FAILED TO LOAD THE PC
21042  046712  046700                           R0624                   ;ERROR LOOP RETURN
21043  046714  000412                           BR      00624           ;GO TO SCOPE EXIT
21044
21045  046716  103403                   A0624:  BCS     E20624          ;BR IF JMP SET "C"
21046  046720  102402                           BVS     E20624          ;BR IF JMP SET "V"
21047  046722  001401                           BEQ     E20624          ;BR IF JMP SET "Z"
21048  046724  100006                           BPL     00624           ;BR IF "N" STILL CLEAR
21049
21050  046726  104006                   E20624: ERROR6                  ;JMP ALTERED CODES - SET
21051  046730  046700                           R0624                   ;ERROR LOOP RETURN
21052  046732  000403                           BR      00624           ;GO TO SCOPE EXIT
21053
21054  046734  046716                   JMP3A:  A0624                   ;JUMP ADDRESS IN JMP3A
21055  046736  104006                   E30624: ERROR6                  ;JMP MODE 3 EXECUTED LIKE MODE 1 OR 2
21056  046740  046700                           R0624                   ;ERROR LOOP RETURN
21057
21058  046742  000004                    00624: SCOPE                   ;CALL SCOPE LOOP UTILITY
21059
21060
```

```
21061                                   ; ***************************************************************
21062                                          .SBTTL T0625 JMP TEST MODE 4; FLAGS = 1111
21063                                   ; ***************************************************************
21064
21065                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21066
21067                                   ;ROM SEQ:       [154,300,306,313,016] FC 1,5
21068
21069                                   ;ACT BUTS:      37[004]100,154 / 15[154]306,306 / 16[306]016,016
21070
21071                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #E20625-2
21072
21073                                   ;CODES:         N:C = 1111 (NO CHANGE)
21074
21075                                   ;SYNC:          BOSJ2 (-) T = 1.9 USEC
21076
21077                                   ;KEY SIG:       K3-3 DM=4L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21078
21079  046744  012700  000625           T0625:  MOV     #0625,R0                ;LOAD R0 WITH TEST NO.
21080  046750  013701  046762                   MOV     @#I0625,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21081  046754  012702  046774           R0625:  MOV     #E20625,R2      ;[R2] = JMP ADDRESS PLUS 2
21082  046760  000277                           SCC                     ;MAKE N:C = 1111
21083
21084  046762  000142                   I0625:  JMP     -(R2)           ;TEST THE JMP - GO TO E20625 MINUS 2
21085
21086  046764  104006                   E10625: ERROR6                  ;JMP FAILED TO LOAD PC
21087  046766  046754                           R0625                   ;ERROR LOOP RETURN
21088  046770  000417                           BR      00625           ;GO TO SCOPE EXIT
21089
21090  046772  000403                           BR      A0625           ;GO TEST FLAGS - JMP LOADED PC OK
21091  046774  104006                   E20625: ERROR6                  ;JMP FAILED TO AUTO-DECREMENT R2
21092  046776  046754                           R0625                   ;ERROR LOOP RETURN
21093  047000  000413                           BR      00625           ;GO TO SCOPE EXIT
21094
21095  047002  103003                   A0625:  BCC     E30625          ;BR IF JMP CLEARED "C"
21096  047004  102002                           BVC     E30625          ;BR IF JMP CLEARED "V"
21097  047006  001001                           BNE     E30625          ;BR IF JMP CLEARED "Z"
21098  047010  100402                           BMI     B0625           ;BR IF "N" STILL SET
21099
21100  047012  104006                   E30625: ERROR6                  ;JMP ALTERED FLAGS
21101  047014  046754                           R0625                   ;ERROR LOOP RETURN
21102
21103  047016  022702  046772           B0625:  CMP     #E20625-2,R2    ;DID JMP UPDATE R2 PROPERLY?
21104  047022  001402                           BEQ     00625           ;BR IF YES
21105
21106  047024  104006                   E40625: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
21107  047026  046754                           R0625                   ;ERROR LOOP RETURN
21108
21109  047030  000004                    00625: SCOPE                   ;CALL SCOPE LOOP UTILITY
21110
21111
```

```
21112                                   ; ***************************************************************
21113                                          .SBTTL T0626 JMP TEST MODE 4; FLAGS = 0000
21114                                   ; ***************************************************************
21115
21116                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21117
21118                                   ;ROM SEQ:       [154,300,306,313,016] FC 1,5
21119
21120                                   ;ACT BUTS:      37[004]100,154 / 15[154]306,306 / 16[306]016,016
21121
21122                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0626
21123
21124                                   ;CODES:         N:C = 0000 (NO CHANGE)
21125
21126                                   ;SYNC:          B05J2 (-) T = 1.9 USEC
21127
21128                                   ;KEY SIG:       K3-3 DM=4L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21129
21130  047032  012700  000626           T0626:  MOV     #0626,R0                ;LOAD R0 WITH TEST NO.
21131  047036  013701  047050                   MOV     @#I0626,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21132
21133  047042  012702  047062           R0626:  MOV     #A0626+2,R2     ;[R2] = JUMP ADDRESS PLUS 2
21134  047046  000257                           CCC                     ;MAKE N:C = 0000
21135
21136  047050  000142                   I0626:  JMP     -(R2)           ;TEST THE JMP - TO TO A0626
21137
21138  047052  104006                   E10626: ERROR6                  ;JMP FAILED TO LOAD PC
21139  047054  047042                           R0626                   ;ERROR LOOP RETURN
21140  047056  000406                           BR      00626           ;GO TO SCOPE EXIT
21141
21142  047060  103403                   A0626:  BCS     E20626          ;BR IF JMP SET "C"
21143  047062  102402                           BVS     E20626          ;BR IF JMP SET "V"
21144  047064  001401                           BEQ     E20626          ;BR IF JMP SET "Z"
21145  047066  100002                           BPL     00626           ;BR IF "N" STILL CLEAR
21146
21147  047070  104006                   E20626: ERROR6                  ;JMP ALTERED CODES - SET
21148  047072  047042                           R0626                   ;ERROR LOOP RETURN
21149
21150  047074  000004                    00626: SCOPE                   ;CALL SCOPE LOOP UTILITY
21151
21152
```

```
21153                                   ; ***************************************************************
21154                                           .SBTTL T0627 JMP TEST MODE 5; FLAGS = 1111
21155                                   ; ***************************************************************
21156
21157                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21158
21159                                   ;ROM SEQ:       [155,303,306,313,016] FC 1,5
21160
21161                                   ;ACT BUTS:      37[004]100,155 / 15[155]306,306 / 16[306]016,016
21162
21163                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0627
21164
21165                                   ;CODES:         N:C = 1111 (NO CHANGE)
21166
21167                                   ;SYNC:          B05J2 (-) T = 2.3 USEC
21168
21169                                   ;KEY SIG:       K3-3 DM=5L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21170
21171  047076  012700  000627          T0627:  MOV     #0627,R0                ;LOAD R0 WITH TEST NO.
21172  047102  013701  047114                  MOV     @#I0627,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21173
21174  047106  012702  047156          R0627:  MOV     #JMP5,R2        ;JMP CONTAINS ADDR+2 OF JUMP ADDRESS
21175  047112  000277                          SCC
21176
21177  047114  000152                  I0627:  JMP     @-(R2)          ;TEST THE JMP - GO TO A0627
21178
21179  047116  104006                  E10627: ERROR6                  ;JMP FAILED TO LOAD PC
21180  047120  047106                          R0627                   ;ERROR LOOP RETURN
21181  047122  000417                          BR      00627           ;GO TO SCOPE OXIT
21182
21183  047124  103003                  A0627:  BCC     E20627          ;BR IF JMP CLEARED "C"
21184  047126  102002                          BVC     E20627
21185  047130  001001                          BNE     E20627
21186  047132  100402                          BMI     B0627
21187
21188  047134  104006                  E20627: ERROR6                  ;JMP ALTERED CODES - CLEARED
21189  047136  047106                          R0627                   ;ERROR LOOP RETURN
21190
21191  047140  022702  047154          B0627:  CMP     #JMP5-2,R2      ;DID R2 GET AUTO-DECREMENTED
21192  047144  001406                          BEQ     00627           ;BR IF YES
21193
21194  047146  104006                  E30627: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
21195  047150  047106                          R0627                   ;ERROR LOOP RETURN
21196  047152  000403                          BR      00627           ;GO TO SCOPE EXIT
21197  047154  047124                          A0627                   ;THIS LOCATION CONTAINS JMP ADDRESS
21198  047156  104006                  JMP5:   ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2
21199  047160  047106                          R0627                   ;ERROR LOOP RETURN
21200
21201  047162  000004                   00627: SCOPE                   ;CALL SCOPE LOOP UTILITY
21202
21203
```

```
21204                                   ; ***************************************************************************
21205                                           .SBTTL T0630 JMP TEST MODE 5; FLAG = 0000
21206                                   ; ***************************************************************************
21207
21208                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21209
21210                                   ;ROM SEQ:       [155,303,306,313,016] FC 1,5
21211
21212                                   ;ACT BUTS:      37[004]100,155 / 15[155]306,306 / 16[306]016,016
21213
21214                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0630
21215
21216                                   ;CODES:         N:C = 0000 (NO CHANGE)
21217
21218                                   ;SYNC:          B05J2 (-) T = 2.3 USEC
21219
21220                                   ;KEY SIG:       K3-3 DM=5L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21221
21222  047164  012700  000630          T0630:  MOV     #0630,R0                ;LOAD R0 WITH TEST NO.
21223  047170  013701  047202                  MOV     @#I0630,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21224
21225  047174  012702  047232          R0630:  MOV     #JMP5A,R2       ;[R2] = ADDR +2 OF JUMP ADDRESS
21226  047200  000257                          CCC                     ;SET N:C = 0000
21227
21228  047202  000152                  I0630:  JMP     @-(R2)          ;TEST THE JMP - GO TO A0630
21229
21230  047204  104006                  E10630: ERROR6                  ;JMP FAILED TO LOAD PC
21231  047206  047174                          R0630                   ;ERROR LOOP RETURN
21232  047210  000412                          BR      00630           ;GO TO SCOPE EXIT
21233
21234  047212  103403                  A0630:  BCS     E20630          ;BR IF JMP SET "C"
21235  047214  102402                          BVS     E20630          ;BR IF JMP SET "V"
21236  047216  001401                          BEQ     E20630          ;BR IF JMP SET "Z"
21237  047220  100006                          BPL     00630           ;BR IF "N" STILL CLEAR
21238
21239  047222  104006                  E20630: ERROR6                  ;JMP ALTERED THE CODES - SET
21240  047224  047174                          R0630                   ;ERROR LOOP RETURN
21241  047226  000403                          BR      00630           ;GO TO SCOPE EXIT
21242
21243  047230  047212                          A0630                   ;THIS LOCATION CONTAINS JUMP ADDRESS
21244  047232  104006                  JMP5A:  ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2
21245  047234  047174                          R0630                   ;ERROR LOOP RETURN
21246
21247  047236  000004                   00630: SCOPE                   ;CALL SCOPE LOOP UTILITY
21248
21249
```

```
21250                                   ; ***************************************************************************
21251                                          .SBTTL T0631 JMP TEST MODE 6; FLAGS = 1111
21252                                   ; ***************************************************************************
21253
21254                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21255
21256                                   ;ROM SEQ:       [156,304,305,300,306,313,016] FC 1,5
21257
21258                                   ;ACT BUTS:      37[004]100,156 / 15[305]306,306 / 16[306]016,016
21259
21260                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0631
21261
21262                                   ;CODES:         N:C = 1111 (NO CHANGE)
21263
21264                                   ;SYNC:          BOSJ2 (-) T = 2.4 USEC
21265
21266                                   ;KEY SIG:       K3-3 DM=6L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
21267
21268  047240  012700  000631          T0631:  MOV     #0631,R0                ;LOAD R0 WITH TEST NO.
21269  047244  013701  047256                  MOV     @#I0631,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21270
21271  047250  012702  047306          R0631:  MOV     #E30631,R2      ;[R2] = BASE ADDRESS TO BE INDEXED
21272  047254  000277                          SCC                     ;MAKE N:C = 1111
21273
21274  047256  000162  177762          I0631:  JMP     A0631-E30631(R2)        ;TEST THE JMP - GO TO A0631
21275
21276  047262  104006                  E10631: ERROR6                  ;JMP FAILED TO LOAD THE PC
21277  047264  047250                          R0631                   ;ERROR LOOP RETURN
21278  047266  000411                          BR      00631           ;GO TO SCOPE EXIT
21279
21280  047270  103003                  A0631:  BCC     E20631          ;BR IF JMP CLEARED "C"
21281  047272  102002                          BVC     E20631
21282  047274  001001                          BNE     E20631
21283  047276  100405                          BMI     00631           ;BR IF "N" STILL SET
21284
21285  047300  104006                  E20631: ERROR6                  ;JMP ALTERED CODES - CLEARED
21286  047302  047250                          R0631                   ;ERROR LOOP RETURN
21287  047304  000402                          BR      00631           ;GO TO SCOPE EXIT
21288
21289  047306  104006                  E30631: ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2 OR
21290  047310  047250                          R0631                   ;ERROR LOOP RETURN
21291                                                                   ;FAILED TO INDEX [R2]
21292
21293  047312  C00004                   00631: SCOPE                   ;CALL SCOPE LOOP UTILITY
21294
21295
```

```
21296                                   ; ***************************************************************************
21297                                           .SBTTL T0632 JMP TEST MODE 6; FLAGS = 0000
21298                                   ; ***************************************************************************
21299
21300                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21301
21302                                   ;ROM SEQ:       [156,304,305,300,306,313,016] FC 1,5
21303
21304                                   ;ACT BUTS:      37[004]100,156 / 15[305]306,306 / 16[306]016,016
21305
21306                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0632
21307
21308                                   ;CODES:         N:C = 0000 (NO CHANGE)
21309
21310                                   ;SYNC:          BOSJ2 (-) T = 2.4 USEC
21311
21312                                   ;KEY SIG:       K3-3 DM=6L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
21313
21314  047314  012700  000632           T0632:  MOV     #0632,R0                ;LOAD R0 WITH TEST NO.
21315  047320  013701  047332                   MOV     @#I0632,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21316
21317  047324  012702  047362           R0632:  MOV     #E30632,R2      ;[R2] = BASE ADDRESS FOR JUMP
21318  047330  000257                           CCC                     ;MAKE N:C = 0000
21319
21320  047332  000162  177762           I0632:  JMP     A0632-E30632(R2)        ;TEST THE JMP - GO TO A0632
21321
21322  047336  104006                   E10632: ERROR6                  ;JMP FAILED TO LOAD PC
21323  047340  047324                           R0632                   ;ERROR LOOP RETURN
21324  047342  000411                           BR      00632           ;GO TO SCOPE EXIT
21325
21326  047344  103403                   A0632:  BCS     E20632          ;BR IF JMP SET "C"
21327  047346  102402                           BVS     E20632          ;BR IF JMP SET "V"
21328  047350  001401                           BEQ     E20632          ;BR IF JMP SET "Z"
21329  047352  100005                           BPL     00632           ;BR IF "N" STILL CLEAR
21330
21331  047354  104006                   E20632: ERROR6                  ;JMP ALTERED CODES
21332  047356  047324                           R0632                   ;ERROR LOOP RETURN
21333  047360  000402                           BR      00632           ;GO TO SCOPE EXIT
21334
21335  047362  104006                   E30632: ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2, OR
21336  047364  047324                           R0632                   ;ERROR LOOP RETURN
21337                                                                   ;FAILED TO INDEX [R2]
21338
21339  047366  000004                    00632: SCOPE                   ;CALL SCOPE LOOP UTILITY
21340
21341
```

```
21342                                   ; ***************************************************************************
21343                                          .SBTTL T0633 JMP TEST MODE 7; FLAGS = 1111
21344                                   ; ***************************************************************************
21345
21346                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21347
21348                                   ;ROM SEQ:       [157,301,302,303,306,313,016] FC 1,5
21349
21350                                   ;ACT BUTS:      37[004]100,157 / 15[302]306,306 / 16[306]016,016
21351
21352                                   ;EXEC:          [360]ALUC=LLLLL :[313] D = #A0633
21353
21354                                   ;CODES:         N:C = 1111 (NO CHANGE)
21355
21356                                   ;SYNC:          B05J2 (-) T = 3 USEC
21357
21358                                   ;KEY SIG:       K3-3 DM=7L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
21359
21360  047370  012700  000633          T0633:  MOV     #0633,R0                ;LOAD R0 WITH TEST NO.
21361  047374  013701  047406                  MOV     @#I0633,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21362
21363  047400  012702  047420          R0633:  MOV     #E20633,R2      ;[R2] = BASE ADDRESS
21364  047404  000277                          SCC                     ;MAKE N:C = 1111
21365
21366  047406  000172  000024          I0633:  JMP     @JMP7-E20633(R2)        ;TEST THE JMP - GO TO A0633
21367
21368  047412  104006                  E10633: ERROR6                  ;JMP FAILED TO LOAD PC
21369  047414  047400                          R0633                   ;ERROR LOOP RETURN
21370  047416  000415                          BR      00633           ;GO TO SCOPE EXIT
21371
21372  047420  104006                  E20633: ERROR6                  ;JMP FAILED TO INDEX OR ACTED LIKE MODE 1 OR 2
21373  047422  047400                          R0633                   ;ERROR LOOP RETURN
21374  047424  000412                          BR      00633           ;GO TO SCOPE EXIT
21375
21376  047426  103003                  A0633:  BCC     E30633          ;BR IF JMP CLEARED "C"
21377  047430  102002                          BVC     E30633          ;BR IF JMP CLEARED "V"
21378  047432  001001                          BNE     E30633          ;BR IF JMP CLEARED "Z"
21379  047434  100406                          BMI     00633           ;BR IF "N" STILL SET
21380
21381  047436  104006                  E30633: ERROR6                  ;JMP ALTERED CODES - CLEARED
21382  047440  047400                          R0633                   ;ERROR LOOP RETURN
21383  047442  000403                          BR      00633           ;GO TO SCOPE EXIT
21384
21385  047444  047426                  JMP7:   A0633                   ;THIS LOCATION CONTAINS JMP ADDRESS
21386
21387  047446  104006                  E40633: ERROR6                  ;JMP EXECUTED LIKE MODE 6
21388  047450  047400                          R0633                   ;ERROR LOOP RETURN
21389
21390  047452  000004                   00633: SCOPE                   ;CALL SCOPE LOOP UTILITY
21391
21392
```

```
21393                                   ; ***************************************************************************
21394                                          .SBTTL T0634 JMP TEST MODE 7; FLAGS = 0000
21395                                   ; ***************************************************************************
21396
21397                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21398
21399                                   ;ROM SEQ:       [157,301,302,303,306,313,016] FC 1,5
21400
21401                                   ;ACT BUTS:      37[004]100,157 / 15[302]306,306 / 16[306]016,016
21402
21403                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0634
21404
21405                                   ;CODES:         N:C = 0000 (NO CHANGE)
21406
21407                                   ;SYNC:          B05J2 (-) T = 3 USEC
21408
21409                                   ;KEY SIG:       K3-3 DM=7L  /  K3-5 JMP L  /  K3-5 JMP+JSR H
21410
21411  047454  012700  000634          T0634:  MOV     #0634,R0                ;LOAD R0 WITH TEST NO.
21412  047460  013701  047472                  MOV     @#I0634,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21413
21414  047464  012702  047504          R0634:  MOV     #E20634,R2      ;[R2] = BASE ADDRESS
21415  047470  000257                          CCC                     ;MAKE N:C = 0000
21416
21417  047472  000172  000024          I0634:  JMP     @JMP7A-E20634(R2)       ;TEST THE JMP - GO TO A0634
21418
21419  047476  104006                  E10634: ERROR6                  ;JMP FAILED TO LOAD PC
21420  047500  047464                          R0634                   ;ERROR LOOP RETURN
21421  047502  000415                          BR      00634           ;GO TO SCOPE EXIT
21422
21423  047504  104006                  E20634: ERROR6                  ;JMP FAILED TO INDEX
21424  047506  047464                          R0634                   ;ERROR LOOP RETURN
21425  047510  000412                          BR      00634           ;GO TO SCOPE EXIT
21426
21427  047512  103403                  A0634:  BCS     E30634          ;BR IF JMP SET "C"
21428  047514  102402                          BVS     E30634          ;BR IF JMP SET "V"
21429  047516  001401                          BEQ     E30634          ;BR IF JMP SET "Z"
21430  047520  100006                          BPL     00634           ;BR IF "N" STILL CLEAR
21431
21432  047522  104006                  E30634: ERROR6                  ;JMP ALTERED CODES - SET
21433  047524  047464                          R0634                   ;ERROR LOOP RETURN
21434  047526  000403                          BR      00634           ;GO TO SCOPE EXIT
21435
21436  047530  047512                  JMP7A:  A0634                   ;THIS LOCATION CONTAINS JUMP ADDRESS
21437
21438  047532  104006                  E40634: ERROR6                  ;JMP EXECUTED LIKE A MODE 6
21439  047534  047464                          R0634                   ;ERROR LOOP RETURN
21440
21441  047536  000004                   00634: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21442                                   ; ***************************************************************************
21443                                   .SBTTL T0635 JSR MODE 1 TEST - LOAD PC  /  PUSH SP
21444                                   ; ***************************************************************************
21445
21446                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21447
21448                                   ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5
21449
21450                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016
21451
21452                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0635
21453
21454                                   ;CODES:         N / A
21455
21456                                   ;SYNC:          B05J2 (-) T = 3 USEC
21457
21458                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP+JSR H  /  K3-5 JSR H
21459
21460  047540  012700  000635  T0635:  MOV     #0635,R0                ;LOAD R0 WITH TEST NO.
21461  047544  013701  047560          MOV     @#I0635,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21462  047550  010605                  MOV     SP,R5           ;SAVE THE SP
21463  047552  012702  047566  R0635:  MOV     #A0635,R2               ;DEST ADDR = A0635
21464  047556  000257                  CCC                     ;SCOPE SYNC
21465
21466  047560  004412          I0635:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0635
21467
21468  047562  104005          E10635: ERROR5                  ;JSR FAILED TO LOAD THE PC
21469  047564  047552                  R0635                   ;ERROR LOOP RETURN
21470
21471  047566  005726          A0635:  TST     (SP)+           ;POP THE SP
21472  047570  020605                  CMP     SP,R5           ;DID JSR PUSH THE SP ?
21473  047572  001404                  BEQ     00635           ;BR IF YES
21474
21475  047574  005746                  TST     -(SP)           ;RESTORE ERROR SP
21476  047576  104005          E20635: ERROR5                  ;JSR FAILED TO PUSH THE SP
21477  047600  047552                  R0635                   ;ERROR LOOP RETURN
21478
21479  047602  010506                  MOV     R5,SP           ;RESTORE SP IN CASE OF ERROR
21480  047604  000004          00635:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21481                                   ; ***************************************************************************
21482                                          .SBTTL T0636 JSR MODE 1 TEST - CHECK RN AND OLD PC
21483                                   ; ***************************************************************************
21484
21485                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21486
21487                                   ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5
21488
21489                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016
21490
21491                                   ;EXEC:          [310] D = 125252  /  [312] D = #E10636  /  [313] D = #A0636
21492
21493                                   ;CODES:         N / A
21494
21495                                   ;SYNC:          B05J2 (-) T = 3 USEC
21496
21497                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H
21498
21499  047606  012700  000636      T0636:  MOV     #0636,R0                ;LOAD R0 WITH TEST NO.
21500  047612  013701  047636              MOV     @#I0636,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21501  047616  010605                      MOV     SP,R5           ;SAVE THE SP
21502  047620  012702  047644      R0636:  MOV     #A0636,R2               ;DEST ADDR = A0636
21503  047624  005066  177776              CLR     -2(SP)          ;INIT STACK LOC TO GET [R4]
21504  047630  012704  125252              MOV     #125252,R4      ;INIT RN = 125252
21505  047634  000257                      CCC                     ;SCOPE SYNC
21506
21507  047636  004412              I0636:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0636
21508
21509  047640  104005              E10636: ERROR5                  ;JSR FAILED TO LOAD THE PC
21510  047642  047620                      R0636                   ;ERROR LOOP RETURN
21511
21512  047644  022726  125252      A0636:  CMP     #125252,(SP)+   ;DID JSR SAVE REG ON STACK
21513  047650  001402                      BEQ     C0636           ;BR IF IT DID
21514
21515  047652  104005              E20636: ERROR5                  ;JSR FAILED TO SAVE REG ON STACK
21516  047654  047620                      R0636                   ;ERROR LOOP RETURN
21517
21518  047656  022704  047640      C0636:  CMP     #E10636,R4      ;DID OLD PC GET SAVED ?
21519  047662  001402                      BEQ     B0636           ;BR IF YES
21520
21521  047664  104005              E30636: ERROR5                  ;JSR FAILED TO SAVE TH OLD PC
21522  047666  047620                      R0636                   ;ERROR LOOP RETURN
21523
21524  047670  010506              B0636:  MOV     R5,SP           ;RESTORE SP IN CASE ERROR SCREWED IT UP
21525  047672  000004              00636:  SCOPE                   ;CALL SCOPE LOOP UTILITY
21526
21527
```

```
21528                                   ; ***************************************************************************
21529                                          .SBTTL T0637 JSR MODE 1 TEST - <N:C> = 0000
21530                                   ; ***************************************************************************
21531  047674  012700  000637          T0637:  MOV     #0637,R0                ;LOAD R0 WITH TEST NO.
21532                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21533
21534                                   ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5
21535
21536                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016
21537
21538                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0637
21539
21540                                   ;CODES:         N:C = 0000 (NO CHANGE)
21541
21542                                   ;SYNC:          B05J2 (-) T = 3 USEC
21543
21544                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H
21545
21546  047700  013701  047714                  MOV     @#I0637,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21547  047704  010605                          MOV     SP,R5           ;SAVE THE SP
21548  047706  012702  047722          R0637:  MOV     #A0637,R2               ;DEST ADDR = A0637
21549  047712  000257                          CCC                     ;N:C = 0000
21550
21551  047714  004412                  I0637:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0637
21552
21553  047716  104005                  E10637: ERROR5                  ;JSR FAILED TO LOAD THE PC
21554  047720  047706                          R0637                   ;ERROR LOOP RETURN
21555
21556  047722  100403                  A0637:  BMI     E20637          ;N:C = 0000 ?
21557  047724  001402                          BEQ     E20637
21558  047726  102401                          BVS     E20637
21559  047730  103002                          BCC     B0637
21560
21561  047732  104005                  E20637: ERROR5                  ;JSR FAILED - ALTERED FLAGS
21562  047734  047706                          R0637                   ;ERROR LOOP RETURN
21563
21564  047736  010506                  B0637:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
21565  047740  000004                  00637:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21566                                   ; ***************************************************************************
21567                                           .SBTTL T0640 JSR MODE 1 TEST - <N:C> = 1111
21568                                   ; ***************************************************************************
21569  047742  012700  000640          T0640:  MOV     #0640,R0                ;LOAD R0 WITH TEST NO.
21570                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21571
21572                                   ;ROM SEQ:       [151,300,307,311,312,306,313,016] FC 1,5
21573
21574                                   ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016
21575
21576                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0640
21577
21578                                   ;CODES:         N:C = 1111 (NO CHANGE)
21579
21580                                   ;SYNC:          B05J2 (-) T = 3 USEC
21581
21582                                   ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H
21583
21584  047746  013701  047762                  MOV     @#I0640,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21585  047752  010605                          MOV     SP,R5           ;SAVE THE SP
21586  047754  012702  047770          R0640:  MOV     #A0640,R2               ;DEST ADDR = A0640
21587  047760  000277                          SCC                     ;N:C = 1111
21588
21589  047762  004412                  I0640:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0640
21590
21591  047764  104005                  E10640: ERROR5                  ;JSR FAILED TO LOAD THE PC
21592  047766  047754                          R0640                   ;ERROR LOOP RETURN
21593
21594  047770  100003                  A0640:  BPL     E20640          ;N:C = 1111 ?
21595  047772  001002                          BNE     E20640
21596  047774  102001                          BVC     E20640
21597  047776  103402                          BCS     B0640
21598  050000  104005                  E20640: ERROR5                  ;JSR ALTERED FLAGS
21599  050002  047754                          R0640                   ;ERROR LOOP RETURN
21600
21601  050004  010506                  B0640:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
21602  050006  000004                  00640:  SCOPE                   ;CALL SCOPE LOOP UTILITY
21603
```

```
21604                                   ; ***************************************************************************
21605                                          .SBTTL T0641 JSR MODE 2 TEST
21606                                   ; ***************************************************************************
21607
21608                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21609
21610                                   ;ROM SEQ:       [152,235,300,307,310,311,312,306,313,016] FC 1,5
21611
21612                                   ;ACT BUTS:      37[004]100,152 / 15[235]306,307 / 16[306]016,016
21613
21614                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0641
21615
21616                                   ;CODES:         N / A
21617
21618                                   ;SYNC:          B05J2 (-) T = 3.25 USEC
21619
21620                                   ;KEY SIG:       K3-3 DM=2L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21621
21622  050010  012700  000641          T0641:  MOV     #0641,R0                ;LOAD R0 WITH TEST NO.
21623  050014  013701  050032                  MOV     @#I0641,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21624  050020  010605                          MOV     SP,R5           ;SAVE THE SP
21625  050022  010506                  R0641:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21626  050024  012702  050040                  MOV     #A0641,R2               ;DEST ADDR = A0641
21627  050030  000257                          CCC                     ;SCOPE SYNC
21628
21629  050032  004422                  I0641:  JSR     R4,(R2)+        ;TEST THE JSR - GO TO A0641
21630
21631  050034  104005                  E10641: ERROR5                  ;JSR FAILED TO LOAD THE PC
21632  050036  050022                          R0641                   ;ERROR LOOP RETURN
21633
21634  050040  005726                  A0641:  TST     (SP)+           ;RESET SP
21635  050042  020605                          CMP     SP,R5           ;DID JSR PUSH STACK ?
21636  050044  001404                          BEQ     00641           ;BR IF YES
21637
21638  050046  005746                          TST     -(SP)           ;RESET SP TO ERROR VALUE
21639  050050  104005                  E20641: ERROR5                  ;JSR FAILED TO PUSH SP
21640  050052  050022                          R0641                   ;ERROR LOOP RETURN
21641
21642  050054  010506                          MOV     R5,SP           ;RESTORE SP JUST IN CASE
21643
21644  050056  000004                  00641:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21645                                   ; ***************************************************************************
21646                                         .SBTTL T0642 JSR MODE 3 TEST
21647                                   ; ***************************************************************************
21648
21649                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21650
21651                                   ;ROM SEQ:       [153,303,307,310,311,312,306,313,016] FC 1,5
21652
21653                                   ;ACT BUTS:      37[004]100,153 / 15[153]306,307 / 16[313]016,016
21654
21655                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0642
21656
21657                                   ;CODES:         N / A
21658
21659                                   ;SYNC:          B05J2 (-) T = 3.5 USEC
21660
21661                                   ;KEY SIG:       K3-3 DM=3L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21662
21663  050060  012700  000642          T0642:  MOV     #0642,R0                ;LOAD R0 WITH TEST NO.
21664  050064  013701  050102                  MOV     @#I0642,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21665  050070  010605                          MOV     SP,R5           ;SAVE THE SP
21666  050072  010506                  R0642:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21667  050074  012702  050126                  MOV     #JSR3,R2                ;DEST ADDR = [JSR3]
21668  050100  000257                          CCC                     ;SCOPE SYNC
21669
21670  050102  004432                  I0642:  JSR     R4,@(R2)+       ;TEST THE JSR - GO TO A0642 VIA JSR3
21671
21672  050104  104005                  E10642: ERROR5                  ;JSR FAILED TO LOAD THE PC
21673  050106  050072                          R0642                   ;ERROR LOOP RETURN
21674
21675  050110  005726                  A0642:  TST     (SP)+           ;RESET SP
21676  050112  020605                          CMP     SP,R5           ;DID JSR PUSH STACK ?
21677  050114  001410                          BEQ     00642           ;BR IF YES
21678
21679  050116  005746                          TST     -(SP)           ;RESET SP TO ERROR VALUE
21680  050120  104005                  E20642: ERROR5                  ;JSR FAILED
21681  050122  050072                          R0642                   ;ERROR LOOP RETURN
21682  050124  000403                          BR      B0642           ;GO EXIT
21683
21684  050126  050110                  JSR3:   A0642                   ;CONTAINS JUMP ADDR
21685  050130  104005                  E30642: ERROR5                  ;JSR EXECUTED LIKE A MODE 1 OR 2
21686  050132  050072                          R0642                   ;ERROR LOOP RETURN
21687
21688  050134  010506                  B0642:  MOV     R5,SP           ;RESTORE SP JUST IN CASE
21689
21690  050136  000004                  00642:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21691                                   ; ***************************************************************************
21692                                           .SBTTL T0643 JSR MODE 4 TEST
21693                                   ; ***************************************************************************
21694
21695                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21696
21697                                   ;ROM SEQ:       [154,300,307,311,312,306,313,016] FC 1,5
21698
21699                                   ;ACT BUTS:      37[004]100,154 / 15[154]306,307 / 16[306]016,016
21700
21701                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0643
21702
21703                                   ;CODES:         N / A
21704
21705                                   ;SYNC:          B05J2 (-) T = 3.1 USEC
21706
21707                                   ;KEY SIG:       K3-3 DM=4L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21708
21709  050140  012700  000643       T0643:  MOV     #0643,R0                ;LOAD R0 WITH TEST NO.
21710  050144  013701  050162               MOV     @#I0643,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21711  050150  010605                       MOV     SP,R5           ;SAVE THE SP
21712  050152  010506               R0643:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21713  050154  012702  050172               MOV     #E20643,R2      ;DEST ADDR = A0643+2
21714  050160  000257                       CCC                     ;SCOPE SYNC
21715
21716  050162  004442               I0643:  JSR     R4,-(R2)        ;TEST THE JSR - GO TO A0643
21717
21718  050164  104005               E10643: ERROR5                  ;JSR FAILED TO LOAD THE PC
21719  050166  050152                       R0643                   ;ERROR LOOP RETURN
21720
21721  050170  000402               A0643:  BR      B0643           ;JUMPED OK - GO CHECK SP
21722  050172  104005               E20643: ERROR5                  ;JSR FAILED TO DECREMENT DEST REG
21723  050174  050152                       R0643                   ;ERROR LOOP RETURN
21724
21725  050176  005726               B0643:  TST     (SP)+           ;RESET SP
21726  050200  020605                       CMP     SP,R5           ;DID JSR PUSH STACK ?
21727  050202  001404                       BEQ     C0643           ;BR IF YES
21728
21729  050204  005746                       TST     -(SP)           ;RESET SP TO ERROR VALUE
21730  050206  104005               E30643: ERROR5                  ;JSR FAILED TO PUSH SP
21731  050210  050152                       R0643                   ;ERROR LOOP RETURN
21732
21733  050212  010506               C0643:  MOV     R5,SP           ;RESTORE SP JUST IN CASE
21734
21735  050214  000004               D0643:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21736                                   ; ***************************************************************************
21737                                          .SBTTL T0644 JSR MODE 5 TEST
21738                                   ; ***************************************************************************
21739
21740                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21741
21742                                   ;ROM SEQ:       [155,303,307,310,311,312,306,313,016] FC 1,5
21743
21744                                   ;ACT BUTS:      37[004]100,155 / 15[155]306,307 / 16[306]016,016
21745
21746                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0644
21747
21748                                   ;CODES:         N / A
21749
21750                                   ;SYNC:          B05J2 (-) T = 3.5 USEC
21751
21752                                   ;KEY SIG:       K3-3 DM=5L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H
21753
21754  050216  012700  000644          T0644:  MOV     #0644,R0                ;LOAD R0 WITH TEST NO.
21755  050222  013701  050252                  MOV     @#I0644,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21756  050226  032737  010000  066642          BIT     #10000,@#BPTLOC ;BREAKPOINT HALT SET ??
21757  050234  001401                          BEQ     .+4             ;BR IF NOT
21758  050236  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
21759  050240  010605                          MOV     SP,R5           ;SAVE THE SP
21760  050242  010506                  R0644:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21761  050244  012702  050300                  MOV     #E30644,R2      ;DEST ADDR = [E30644 - 2]
21762  050250  000257                          CCC                     ;SCOPE SYNC
21763
21764  050252  004452                  I0644:  JSR     R4,@-(R2)       ;TEST THE JSR - GO TO A0644
21765
21766  050254  104005                  E10644: ERROR5                  ;JSR FAILED TO LOAD THE PC
21767  050256  050242                          R0644                   ;ERROR LOOP RETURN
21768
21769  050260  005726                  A0644:  TST     (SP)+           ;RESET SP
21770  050262  020605                          CMP     SP,R5           ;DID JSR PUSH STACK ?
21771  050264  001410                          BEQ     00644           ;BR IF YES
21772
21773  050266  005746                          TST     -(SP)           ;RESET SP TO ERROR VALUE
21774  050270  104005                  E20644: ERROR5                  ;JSR FAILED TO PUSH SP
21775  050272  050242                          R0644                   ;ERROR LOOP RETURN
21776  050274  000403                          BR      B0644           ;GO EXIT
21777
21778  050276  050260                          A0644                   ;CONTAINS JUMP ADDRESS
21779  050300  104005                  E30644: ERROR5                  ;JSR EXECUTED LIKE A MODE 1 OR 2
21780  050302  050242                          R0644                   ;ERROR LOOP RETURN
21781
21782  050304  010506                  B0644:  MOV     R5,SP           ;RESTORE SP JUST IN CASE
21783
21784  050306  000004                  00644:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21785                                   ; ***************************************************************************
21786                                          .SBTTL T0645 JSR MODE 6 TEST
21787                                   ; ***************************************************************************
21788
21789                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21790
21791                                   ;ROM SEQ:       [156,304,305,300,307,310,311,312,306,313,016] FC 1,5
21792
21793                                   ;ACT BUTS:      37[004]100,156 / 15[305]306,307 / 16[306]016,016
21794
21795                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0645
21796
21797                                   ;CODES:         N / A
21798
21799                                   ;SYNC:          B05J2 (-) T = 3.5 USEC
21800
21801                                   ;KEY SIG:       K3-3 DM=6L  /  K3-5 JSR H  /  K3-5 JMP+JSR H
21802
21803  050310  012700  000645          T0645:  MOV     #0645,R0                ;LOAD R0 WITH TEST NO.
21804  050314  013701  050332                  MOV     @#I0645,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21805  050320  010605                          MOV     SP,R5           ;SAVE THE SP
21806  050322  010506                  R0645:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21807  050324  012702  050336                  MOV     #E10645,R2      ;[R2] = BASE DEST ADDR
21808  050330  000257                          CCC                     ;SCOPE SYNC
21809
21810  050332  004462  000004          I0645:  JSR     R4,A0645-E10645(R2)     ;TEST THE JSR - GO TO A0645
21811
21812  050336  104005                  E10645: ERROR5                  ;JSR FAILED TO LOAD THE PC OR INDEX FAILED
21813  050340  050322                          R0645                   ;ERROR LOOP RETURN
21814
21815  050342  005726                  A0645:  TST     (SP)+           ;RESET SP
21816  050344  020605                          CMP     SP,R5           ;DID JSR PUSH STACK ?
21817  050346  001404                          BEQ     00645           ;BR IF YES
21818
21819
21820  050350  005746                          TST     -(SP)           ;RESET SP TO ERROR VALUE
21821  050352  104005                  E20645: ERROR5                  ;JSR FAILED TO PUSH STACK
21822  050354  050322                          R0645                   ;ERROR LOOP RETURN
21823  050356  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
21824
21825  050360  000004                  00645:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
21826                                   ; ***************************************************************************
21827                                          .SBTTL T0646 JSR MODE 7 TEST
21828                                   ; ***************************************************************************
21829
21830                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21831
21832                                   ;ROM SEQ:       [157,301,302,303,307,310,311,312,306,313,016] FC 1,5
21833
21834                                   ;ACT BUTS:      37[004]100,157 / 15[302]306,307 / 16[306]016,016
21835
21836                                   ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0646
21837
21838                                   ;CODES:         N / A
21839
21840                                   ;SYNC:          B05J2 (-) T = 4.1 USEC
21841
21842                                   ;KEY SIG:       K3-3 DM=7L  /  K3-5 JSR H  /  K3-5 JMP+JSR H
21843
21844  050362  012700  000646          T0646:  MOV     #0646,R0                ;LOAD R0 WITH TEST NO.
21845  050366  013701  050404                  MOV     @#I0646,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21846  050372  010605                         MOV     SP,R5           ;SAVE THE SP
21847  050374  010506                  R0646:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
21848  050376  012702  050410                  MOV     #E10646,R2      ;BASE DEST ADDR = E10646
21849  050402  000257                         CCC                     ;SCOPE SYNC
21850
21851  050404  004472  000022          I0646:  JSR     R4,@JSR7-E10646(R2);TEST THE JSR - GO TO A0646 VIA JSR7
21852
21853  050410  104005                  E10646: ERROR5                  ;JSR FAILED TO LOAD THE PC
21854                                                                  ;OR INDEX FAILED
21855  050412  050374                         R0646                   ;ERROR LOOP RETURN
21856
21857  050414  005726                  A0646:  TST     (SP)+           ;RESET SP
21858  050416  020605                         CMP     SP,R5           ;DID JSR PUSH STACK ?
21859  050420  001410                         BEQ     00646           ;BR IF YES
21860
21861  050422  005746                         TST     -(SP)           ;RESET SP TO ERROR VALUE
21862  050424  104005                  E20646: ERROR5                  ;JSR FAILED TO PUSH STACK
21863  050426  050374                         R0646                   ;ERROR LOOP RETURN
21864  050430  000403                         BR      B0646           ;SKIP TO EXIT
21865
21866  050432  050414                  JSR7:   A0646                   ;CONTAINS JUMP ADDR
21867  050434  104005                  E30646: ERROR5                  ;JSR WORKED LIKE A MODE 1 OR 2
21868  050436  050374                         R0646                   ;ERROR LOOP RETURN
21869
21870  050440  010506                  B0646:  MOV     R5,SP           ;RESTORE SP JUST IN CASE
21871
21872  050442  000004                  00646:  SCOPE                   ;CALL SCOPE LOOP UTILITY
21873
21874
```

```
21875                                   ; ************************************************************************
21876                                          .SBTTL TO647 SOB TEST, [R] = 1, NO BRANCH
21877                                   ; ************************************************************************
21878
21879                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21880
21881                                   ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7
21882
21883                                   ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016
21884
21885                                   ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000
21886
21887                                   ;CODES:         N / A
21888
21889                                   ;SYNC:          B05J2 (-) T = 2 USEC
21890
21891                                   ;KEY SIG:       K3-6 SOB L  /  K1-7 D(15:00)=0 H
21892
21893  050444  012700  000647          TO647:  MOV     #0647,R0                ;LOAD R0 WITH TEST NO.
21894  050450  013701  050472                  MOV     @#I0647,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21895
21896  050454  012702  000001          R0647:  MOV     #1,R2           ;SET SOB COUNTER = 1
21897  050460  000403                          BR      I0647-2         ;GO DO THE SOB
21898
21899  050462  104006                  E0647:  ERROR6                  ;SOB SHOULDN'T HAVE BRANCHED HERE
21900  050464  050454                          R0647                   ;ERROR LOOP RETURN
21901  050466  000402                          BR      00647           ;GO TO SCOPE CALL
21902
21903  050470  000257                          CCC                     ;SYNC INSTR.
21904  050472  077205                  I0647:  SOB     R2,E0647                ;TEST THE SOB
21905
21906  050474  000004                   00647: SCOPE                   ;CALL SCOPE LOOP UTILITY
21907
21908
```

```
21909                                   ; ***************************************************************************
21910                                          .SBTTL T0650 SOB TEST, [R] = 5, BRANCH 4 TIMES
21911                                   ; ***************************************************************************
21912
21913                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21914
21915                                   ;ROM SEQ:        [130,342,343,344,346,016] FC 1,7
21916
21917                                   ;ACT BUTS:       37[004]100,130 / 12[342]344,344 / 16[344]016,016
21918
21919                                   ;EXEC:           [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME)
21920                                   ;                [346]ALUC=LLHHL :[016] D = #A0650
21921                                   ;CODES:          N / A
21922
21923                                   ;SYNC:           B05J2 (-) T = 2.36 USEC
21924
21925                                   ;KEY SIG:        K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L
21926
21927  050476  012700  000650          T0650:  MOV      #0650,R0                ;LOAD R0 WITH TEST NO.
21928  050502  013701  050526                  MOV      @#I0650,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21929
21930  050506  012702  000005          R0650:  MOV      #5,R2           ;SET SOB COUNTER = 5
21931  050512  012705  177773                  MOV      #-5,R5          ;SET UP R5 TO COUNT 5 BRANCHES
21932  050516  000402                          BR       I0650-2         ;GO DO THE SOB
21933
21934  050520  005205                  A0650:  INC      R5              ;COUNT ONE BRANCH
21935  050522  001412                          BEQ      E20650          ;BR IF TOO MANY LOOPS BY SOB
21936
21937  050524  000257                          CCC                      ;SCOPE SYNC
21938  050526  077204                  I0650:  SOB      R2,A0650                ;TEST THE SOB
21939  050530  000402                          BR       S0B2            ;SKIP NEXT TWO WORDS
21940
21941  050532  000474                  S0B1:   BR       S0B3            ;USED BY LAST SOB TEST TO TEST MAX OFFSET
21942  050534  000240                          NOP
21943
21944  050536  005702                  S0B2:   TST      R2              ;R2 SHOULD CONTAIN 0
21945  050540  001405                          BEQ      00650           ;BR IF IT DOES
21946
21947  050542  104006                  E10650: ERROR6                   ;SOB COUNTER NOT ZERO
21948  050544  050506                          R0650                    ;ERROR LOOP RETURN
21949  050546  000402                          BR       00650           ;GO TO SCOPE CALL
21950  050550  104006                  E20650: ERROR6                   ;SOB MADE TOO MANY BRANCHES
21951  050552  050506                          R0650                    ;ERROR LOOP RETURN
21952  050554  000004                  00650:  SCOPE                    ;CALL SCOPE LOOP UTILITY
21953
```

```
21954                                   ; ***************************************************************
21955                                           .SBTTL T0651 SOB TEST, [R] = 1, FLAGS = 1111
21956                                   ; ***************************************************************
21957
21958                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
21959
21960                                   ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7
21961
21962                                   ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016
21963
21964                                   ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000
21965
21966                                   ;CODES:         N:C = 1111 (NO CHANGE)
21967
21968                                   ;SYNC:          B05J2 (-) T = 2 USEC
21969
21970                                   ;KEY SIG:       K3-6 SOB L  /  K1-7 D(15:00)=0 H
21971
21972  050556  012700  000651          T0651:  MOV     #0651,R0                ;LOAD R0 WITH TEST NO.
21973  050562  013701  050574                  MOV     @#I0651,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
21974
21975  050566  012702  000001          R0651:  MOV     #1,R2           ;SET SOB COUNTER = 1
21976  050572  000277                          SCC                     ;MAKE N:C = 1111
21977
21978  050574  077202                  I0651:  SOB     R2,I0651-2      ;TEST THE SOB
21979
21980  050576  103003                          BCC     E0651           ;BR IF C = 0
21981  050600  102002                          BVC     E0651           ;BR IF V = 0
21982  050602  001001                          BNE     E0651           ;BR IF Z = 0
21983  050604  100402                          BMI     00651           ;BR IF N = 1
21984
21985  050606  104006                  E0651:  ERROR6                  ;SOB ALTERED CODES - CLEARED ONE
21986  050610  050566                          R0651                   ;ERROR LOOP RETURN
21987
21988  050612  000004                  00651:  SCOPE                   ;CALL SCOPE LOOP UTILITY
21989
21990
```

```
                                ; ***************************************************************
                                ;       .SBTTL T0652 SOB TEST, [R] = 1, FLAGS = 0000
                                ; ***************************************************************
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7
                                ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016
                                ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000
                                ;CODES:         N:C = 0000 (NO CHANGE)
                                ;SYNC:          B05J2 (-) T = 2 USEC
                                ;KEY SIG:       K3-6 SOB L  /. K1-7 D(15:00)=0 H
050614  012700  000652    T0652:  MOV     #0652,R0                ;LOAD R0 WITH TEST NO.
050620  013701  050632            MOV     @#I0652,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050624  012702  000001    R0652:  MOV     #1,R2           ;SET SOB COUNTER = 1
050630  000257            I0652:  CCC                     ;MAKE N:C = 0000
050632  077202                    SOB     R2,I0652-2      ;TEST THE SOB
050634  103403                    BCS     E0652           ;BR IF C = 1
050636  102402                    BVS     E0652           ;BR IF V = 1
050640  001401                    BEQ     E0652           ;BR IF Z = 1
050642  100002                    BPL     00652           ;BR IF N = 0
050644  104006    E0652:  ERROR6                          ;SOB ALTERED CODES - SET ONE
050646  050624            R0652                           ;ERROR LOOP RETURN
050650  000004    00652:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
22028                                   ; ***************************************************************************
22029                                           .SBTTL T0653 SOB TEST, [R] = 5, FLAGS = 1111
22030                                   ; ***************************************************************************
22031
22032                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22033
22034                                   ;ROM SEQ:       [130,342,343,344,346,016] FC 1,7
22035
22036                                   ;ACT BUTS:      37[004]100,130 / 12[342]344,344 / 16[344]016,016
22037
22038                                   ;EXEC:          [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME9
22039                                   ;               [346]ALUC=LLHHL :[016] D = #I0653
22040                                   ;CODES:         N:C = 1111 (NO CHANGE)
22041
22042                                   ;SYNC:          B05J2 (-) T = 2.36 USEC
22043
22044                                   ;KEY SIG:       K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L
22045
22046  050652  012700  000653           T0653:  MOV     #0653,R0                ;LOAD R0 WITH TEST NO.
22047  050656  013701  050670                   MOV     @#I0653,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22048
22049  050662  012702  000005           R0653:  MOV     #5,R2           ;SET SOB COUNTER = 5
22050  050666  000277                           SCC                     ;MAKE N:C = 1111
22051
22052  050670  077201                   I0653:  SOB     R2,I0653                ;TEST THE SOB
22053
22054  050672  103003                           BCC     E0653           ;BR IF C = 0
22055  050674  102002                           BVC     E0653           ;BR IF V = 0
22056  050676  001001                           BNE     E0653           ;BR IF Z = 0
22057  050700  100402                           BMI     00653           ;BR IF N = 1
22058
22059  050702  104006                   E0653:  ERROR6                  ;SOB ALTERED CODES - CLEARED ONE
22060  050704  050662                           R0653                   ;ERROR LOOP RETURN
22061
22062  050706  000004                    00653: SCOPE                   ;CALL SCOPE LOOP UTILITY
22063
22064
```

```
22065                                   ; ***************************************************************************
22066                                           .SBTTL T0654 SOB TEST, [R] = 5, FLAGS = 0000
22067                                   ; ***************************************************************************
22068
22069                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22070
22071                                   ;ROM SEQ:       [130,342,343,344,346,016] FC 1,7
22072
22073                                   ;ACT BUTS:      37[004]100,130 / 12[342]344,344 / 16[344]016,016
22074
22075                                   ;EXEC:          [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME)
22076                                   ;               [346]ALUC=LLHHL :[016] D = #I0654
22077                                   ;CODES:         N:C = 0000 (NO CHANGE)
22078
22079                                   ;SYNC:          B05J2 (-) T = 2.36 USEC
22080
22081                                   ;KEY SIG:       K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L
22082
22083  050710  012700  000654          T0654:  MOV     #0654,R0                ;LOAD R0 WITH TEST NO.
22084  050714  013701  050726                  MOV     @#I0654,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22085
22086  050720  012702  000005          R0654:  MOV     #5,R2           ;SET SOB COUNTER = 5
22087  050724  000257                  SOB3:   CCC                     ;MAKE N:C = 0000
22088
22089  050726  077277                  I0654:  SOB     R2,SOB1         ;TEST THE SOB
22090
22091  050730  103403                          BCS     E0654           ;BR IF C = 1
22092  050732  102402                          BVS     E0654           ;BR IF V = 1
22093  050734  001401                          BEQ     E0654           ;BR IF Z = 1
22094  050736  100002                          BPL     00654           ;BR IF N = 0
22095
22096  050740  104006          E0654:  ERROR6                          ;SOB ALTERED CODES - SET ONE
22097  050742  050720                  R0654                           ;ERROR LOOP RETURN
22098
22099  050744  000004           00654: SCOPE                           ;CALL SCOPE LOOP UTILITY
22100
22101
```

```
22102                                   ; ***************************************************************************
22103                                          .SBTTL T0655 RTS TEST - <N:C> = 1111
22104                                   ; ***************************************************************************
22105
22106                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22107
22108                                   ;ROM SEQ:       [124,323,324,325,016] FC 1,6
22109
22110                                   ;ACT BUTS:      37[004]100,124 / 16[324]016,016
22111
22112                                   ;EXEC:          [323] D = #A0655  /  [325] D = 177777
22113
22114                                   ;CODES:         N:C = 1111 (NO CHANGE)
22115
22116                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
22117
22118                                   ;KEY SIG:       K3-6 RTS L  /  K5-5 BC01 H
22119
22120  050746  012700  000655           T0655:  MOV     #0655,R0                ;LOAD R0 WITH TEST NO.
22121  050752  013701  051000                   MOV     @#I0655,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22122  050756  010605                           MOV     SP,R5           ;SAVE THE SP
22123  050760  012704  177777           R0655:  MOV     #-1,R4          ;R3 SHOULD GET 177777
22124  050764  010506                           MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22125  050766  012703  051010                   MOV     #A0655,R3               ;RTS SHOULD LOAD PC FROM [R3]
22126  050772  012746  177777                   MOV     #-1,-(SP)       ;RTS SHOULD LOAD R3 WITH 177777
22127  050776  000277                           SCC                     ;N:C = 1111
22128
22129  051000  000203           I0655:  RTS     R3              ;TEST THE RTS - GO TO A0655
22130
22131  051002  104005           E10655: ERROR5                  ;RTS FAILED TO LOAD THE PC
22132  051004  050760                   R0655                   ;ERROR LOOP RETURN ADDRESS
22133  051006  000420                   BR      D0655           ;GO TO EXIT - SCHOOLS OUT
22134
22135  051010  100003           A0655:  BPL     E20655          ;N:C = 1111 ?
22136  051012  001002                   BNE     E20655
22137  051014  102001                   BVC     E20655
22138  051016  103402                   BCS     B0655
22139
22140  051020  104005           E20655: ERROR5                  ;RTS ALTERED CODES - CLEARED ONE
22141  051022  050760                   R0655                   ;ERROR LOOP RETURN
22142
22143  051024  020403           B0655:  CMP     R4,R3           ;DID R3 GET LOADED FROM STACK ?
22144  051026  001402                   BEQ     C0655           ;BR IF YES
22145
22146  051030  104000           E30655: ERROR                   ;RTS FAILED TO LOAD REG
22147  051032  050760                   R0655                   ;ERROR LOOP RETURN
22148
22149  051034  020506           C0655:  CMP     R5,SP           ;DID RTS POP THE STACK POINTER ?
22150  051036  001405                   BEQ     00655           ;BR IF YES
22151
22152  051040  010504                   MOV     R5,R4           ;[R4] = S / B SP
22153  051042  010603                   MOV     SP,R3           ;[R3] = WAS SP
22154  051044  104000           E40655: ERROR                   ;RTS FAILED TO POP SP
22155  051046  050760                   R0655                   ;ERROR LOOP RETURN
22156
22157  051050  010506           D0655:  MOV     R5,SP           ;FIX THE SP
```

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 22158  051052  000004                  00655:  SCOPE                   ;CALL  THE SCOPE LOOP UTILITY
 22159
```

```
22160                                   ; ***************************************************************************
22161                                         .SBTTL T0656 RTS TEST - <N:C> = 0000
22162                                   ; ***************************************************************************
22163
22164                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22165
22166                                   ;ROM SEQ:       [124,323,324,325,016] FC 1,6
22167
22168                                   ;ACT BUTS:      37[004]100,124 / 16[324]016,016
22169
22170                                   ;EXEC:          [323] D = #A0656  /  [325] D = 177777
22171
22172                                   ;CODES:         N:C = 0000 (NO CHANGE)
22173
22174                                   ;SYNC:          B05J2 (-) T = 2.5 USEC
22175
22176                                   ;KEY SIG:       K3-6 RTS L  /  K5-5 BC01 H
22177
22178  051054  012700  000656          T0656:  MOV     #0656,R0                ;LOAD R0 WITH TEST NO.
22179  051060  013701  051106                  MOV     @#I0656,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22180  051064  010605                          MOV     SP,R5           ;SAVE THE SP
22181  051066  012704  177777          R0656:  MOV     #-1,R4          ;R3 SHOULD GET 177777
22182  051072  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22183  051074  012703  051116                  MOV     #A0656,R3               ;RTS SHOULD LOAD PC FROM [R3]
22184  051100  012746  177777                  MOV     #-1,-(SP)       ;RTS SHOULD LOAD R3 WITH 177777
22185  051104  000257                          CCC                     ;N:C = 0000
22186
22187  051106  000203          I0656:  RTS     R3                      ;TEST THE RTS - GO TO A0656
22188
22189  051110  104005          E10656: ERROR5                          ;RTS FAILED TO LOAD THE PC
22190  051112  051066                  R0656                           ;ERROR LOOP RETURN ADDRESS
22191  051114  000420                  BR      D0656                   ;GO TO EXIT - SCHOOLS OUT
22192
22193  051116  100403          A0656:  BMI     E20656          ;N:C = 0000 ?
22194  051120  001402                  BEQ     E20656
22195  051122  102401                  BVS     E20656
22196  051124  103002                  BCC     B0656
22197
22198  051126  104005          E20656: ERROR5                  ;RTS ALTERED CODES - CLEARED ONE
22199  051130  051066                  R0656                   ;ERROR LOOP RETURN
22200
22201  051132  020403          B0656:  CMP     R4,R3           ;DID R3 GET LOADED FROM STACK ?
22202  051134  001402                  BEQ     C0656           ;BR IF YES
22203
22204  051136  104000          E30656: ERROR                   ;RTS FAILED TO LOAD REG
22205  051140  051066                  R0656                   ;ERROR LOOP RETURN
22206
22207  051142  020506          C0656:  CMP     R5,SP           ;DID RTS POP THE STACK POINTER ?
22208  051144  001405                  BEQ     00656           ;BR IF YES
22209
22210  051146  010504                  MOV     R5,R4           ;[R4] = S / B SP
22211  051150  010603                  MOV     SP,R3           ;[R3] = WAS SP
22212  051152  104000          E40656: ERROR                   ;RTS FAILED TO POP SP
22213  051154  051066                  R0656                   ;ERROR LOOP RETURN
22214
22215  051156  010506          D0656:  MOV     R5,SP           ;FIX THE SP
```

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 22216  051160  000004                  00656:  SCOPE                   ;CALL  THE SCOPE LOOP UTILITY
 22217
```

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22218                                   ; ***************************************************************************
22219                                         .SBTTL T0657 RTT TEST - <N:C> = 1111
22220                                   ; ***************************************************************************
22221
22222                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22223
22224                                   ;ROM SEQ:       [101,320,321,322,017,015,013] FC 1,6,10
22225
22226                                   ;ACT BUTS:      37[004]100,101 / 26[017]010,013
22227
22228                                   ;EXEC:          [320] D = #A0657  /  [322] D = 340
22229
22230                                   ;CODES:         [322] SPS=7  /  N:C = 0000
22231
22232                                   ;SYNC:          B05J2 (-) T = 3 USEC
22233
22234                                   ;KEY SIG:       K3-6 RTT H  /  K3-6 RTI+RTT L  /  K5-5 BC01 H
22235
22236  051162  012700  000657          T0657:  MOV     #0657,R0                ;LOAD R0 WITH TEST NO.
22237  051166  013701  051220                  MOV     @#I0657,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22238  051172  010605                          MOV     SP,R5           ;SAVE THE SP
22239  051174  010506                  R0657:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22240  051176  012704  000340                  MOV     #340,R4         ;[R4] = S / B PSW AT HTIS POINT
22241  051202  012746  000340                  MOV     #340,-(SP)      ;NEW PSW S / B = 340
22242  051206  012746  051230                  MOV     #A0657,-(SP)    ;NEW PC S / B = A0657
22243  051212  005037  177776                  CLR     @#PSW           ;CLEAR THE PSW
22244  051216  000277                          SCC                     ;N:C = 1111
22245
22246  051220  000006          I0657:  RTT                             ;TEST THE RTT - GO TO A0657
22247
22248  051222  104005          E10657: ERROR5                          ;RTT FAILED TO LOAD THE PC
22249  051224  051174                  R0657                           ;ERROR LOOP RETURN ADDRESS
22250  051226  000414                  BR      C0657                   ;GO TO EXIT - SCHOOL'S OUT
22251
22252  051230  013703  177776  A0657:  MOV     @#PSW,R3        ;SAVE THE PSW
22253  051234  020403                  CMP     R4,R3           ;WAS PSW = 340 ?
22254  051236  001402                  BEQ     B0657           ;BR IF IT WAS
22255
22256  051240  104000          E20657: ERROR                   ;RTT FAILED TO LOAD PSW PROPERLY
22257                                                          ;[R3] = WAS PSW
22258                                                          ;[R4] = S / B PSW
22259  051242  051174                  R0657                   ;ERROR LOOP RETURN ADDRESS
22260
22261  051244  020506          B0657:  CMP     R5,SP           ;DID RTT UPDATE THE SP ?
22262  051246  001405                  BEQ     00657           ;BR IF YES
22263
22264  051250  010504                  MOV     R5,R4           ;[R4] = S / B SP
22265  051252  010603                  MOV     SP,R3           ;[R3] = WAS SP
22266  051254  104000          E30657: ERROR                   ;RTT FAILED TO UPDATE SP
22267  051256  051174                  R0657                   ;ERROR LOOP RETURN ADDRESS
22268
22269  051260  010506          C0657:  MOV     R5,SP           ;FIX THE SP
22270  051262  000004          00657:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
22271
```

```
22272                                   ; ***************************************************************************
22273                                          .SBTTL T0660 RTT TEST - <N:C> = 0000
22274                                   ; ***************************************************************************
22275
22276                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22277
22278                                   ;ROM SEQ:       [101,320,321,322,017,015,013] FC 1,6,10
22279
22280                                   ;ACT BUTS:      37[004]100,101 / 26[017]010,013
22281
22282                                   ;EXEC:          [320] D = #A0660  /  [322] D = 000017
22283
22284                                   ;CODES:         [322] SPS=7  /  N:C = 1111
22285
22286                                   ;SYNC:          B05J2 (-) T = 3 USEC
22287
22288                                   ;KEY SIG:       K3-6 RTI+RTT L  /  K3-6 RTT H  /  K5-5 BC01 H
22289
22290  051264  012700  000660          T0660:  MOV     #0660,R0                ;LOAD R0 WITH TEST NO.
22291  051270  013701  051324                  MOV     @#I0660,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22292  051274  010605                          MOV     SP,R5           ;SAVE THE SP
22293  051276  010506                  R0660:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22294  051300  012704  000017                  MOV     #017,R4         ;[R4] = S / B PSW AT HTIS POINT
22295  051304  012746  000017                  MOV     #017,-(SP)      ;NEW PSW S / B = 017
22296  051310  012746  051334                  MOV     #A0660,-(SP)    ;NEW PC S / B = A0660
22297  051314  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW] = 340
22298  051322  000257                          CCC                     ;N:C = 0000
22299
22300  051324  000006          I0660:  RTT                             ;TEST THE RTT - GO TO A0660
22301
22302  051326  104005          E10660: ERROR5                          ;RTT FAILED TO LOAD THE PC
22303  051330  051276                  R0660                           ;ERROR LOOP RETURN ADDRESS
22304  051332  000414                  BR      C0660                   ;GO TO EXIT - SCHOOL'S OUT
22305
22306  051334  013703  177776  A0660:  MOV     @#PSW,R3                ;SAVE THE PSW
22307  051340  020403                  CMP     R4,R3                   ;WAS PSW = 017 ?
22308  051342  001402                  BEQ     B0660                   ;BR IF IT WAS
22309
22310  051344  104000          E20660: ERROR                           ;RTT FAILED TO LOAD PSW PROPERLY
22311                                                                  ;[R3] = WAS PSW
22312                                                                  ;[R4] = S / B PSW
22313  051346  051276                  R0660                           ;ERROR LOOP RETURN ADDRESS
22314
22315  051350  020506          B0660:  CMP     R5,SP                   ;DID RTT UPDATE THE SP ?
22316  051352  001405                  BEQ     00660                   ;BR IF YES
22317
22318  051354  010504                  MOV     R5,R4                   ;[R4] = S / B SP
22319  051356  010603                  MOV     SP,R3                   ;[R3] = WAS SP
22320  051360  104000          E30660: ERROR                           ;RTT FAILED TO UPDATE SP
22321  051362  051276                  R0660                           ;ERROR LOOP RETURN ADDRESS
22322
22323  051364  010506          C0660:  MOV     R5,SP                   ;FIX THE SP
22324  051366  000004          00660:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
22325
```

```
22326                                   ; ***************************************************************************
22327                                          .SBTTL T0661 MARK INSTRUCTION TEST - <N:C>=0000
22328                                   ; ***************************************************************************
22329
22330                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22331
22332                                   ;ROM SEQ:       [112,353,354,355,356,357,016] FC 1,5
22333
22334                                   ;ACT BUTS:      37[004]100,112 / 16[356]016,016
22335
22336                                   ;EXEC:          [355] D = #80661+2  /  [356] D = 125252  /  [357] D = #A0661
22337
22338                                   ;CODES:         N:C = 0000 (NO CHANGE)
22339
22340                                   ;SYNC:          BOSJ2 (-) T = 2.6 USEC
22341
22342                                   ;KEY SIG:       K3-6 MARK L  /  K5-5 BC01 H
22343
22344  051370  012700  000661      T0661:  MOV     #0661,R0                ;LOAD R0 WITH TEST NO.
22345  051374  013701  051420              MOV     @#I0661,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22346  051400  010604                      MOV     SP,R4           ;SAVE SP
22347  051402  012703  125252              MOV     #125252,R3      ;[R5] SHOULD BE 125252
22348  051406  012705  051444      R0661:  MOV     #A0661,R5               ;MARK GOES TO A0661 VIA [R5]
22349  051412  010337  051432              MOV     R3,@#B0661      ;INITIALIZE WORD LOADED INTO R5
22350  051416  000257                      CCC                     ;N:C=0000
22351
22352  051420  006404              I0661:  MARK+4                  ;TEST THE MARK
22353
22354  051422  010406                      MOV     R4,SP           ;RESET SP
22355  051424  104005              E10661: ERROR5                  ;MARK FAILED TO EXECUTE
22356  051426  051406                      R0661                   ;ERROR LOOP RETURN ADDRESS
22357
22358  051430  000435                      BR      C0661           ;GO TO SCOPE EXIT
22359
22360  051432  125252              B0661:  125252                  ;THIS WORD SHOULD GET LOADED INTO R5
22361
22362  051434  010406                      MOV     R4,SP           ;RESET SP
22363  051436  104005              E20661: ERROR5                  ;MARK FAILED TO LOAD RC FROM [R5]
22364  051440  051406                      R0661                   ;ERROR LOOP RETURN ADDRESS
22365
22366  051442  000430                      BR      C0661           ;GO TO SCOPE EXIT
22367
22368  051444  100403              A0661:  BMI     D0661           ;N:C=0000?
22369  051446  001402                      BEQ     D0661
22370  051450  102401                      BVS     D0661
22371  051452  103005                      BCC     C0661
22372
22373  051454  013702  177776      D0661:  MOV     @#PSW,R2        ;SAVE FLAGS IN R2
22374  051460  010406                      MOV     R4,SP           ;RESET SP
22375  051462  104006              E30661: ERROR6                  ;MSRK SET A FLAG -[PSW] IN R2
22376  051464  051406                      R0661                   ;ERROR LOOP RETURN ADDRESS
22377
22378  051466  020627  051434      C0661:  CMP     SP,#B0661+2     ;DID MARK RESET SP?
22379  051472  001405                      BEQ     F0661           ;BR IF YES
22380  051474  010602                      MOV     SP,R2           ;PUT BAD SP IN R2
22381  051476  010406                      MOV     R4,SP           ;RESET SP
```

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.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 548
DBQEAB.CMB      T0661 MARK INSTRUCTION TEST - <N:C>=0000

 22382  051500  104005          E40661: ERROR5                  ;MARK FAILED TO RESET SP -[R2]=SP WAS
 22383  051502  051406                  R0661                   ;ERROR LOOP RETURN ADDRESS
 22384
 22385  051504  000407                  BR      00661           ;GO TO SCOPE EXIT
 22386
 22387  051506  020503          F0661:  CMP     R5,R3           ;DID MARK RESTORE OLD R5
 22388  051510  001404                  BEQ     G0661           ;BR IF YES
 22389
 22390  051512  010502                  MOV     R5,R2           ;[R2]=WAS R5
 22391  051514  010406                  MOV     R4,SP           ;RESET SP
 22392  051516  104007          E50661: ERROR7                  ;MARK FAILED TO RESET R5
 22393  051520  051406                  R0661                   ;ERROR LOOP RETURN
 22394
 22395  051522  010406          G0661:  MOV     R4,SP           ;RESET SP
 22396
 22397  051524  000004          00661:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************************
                                        ;       .SBTTL T0662 MARK INSTRUCTION TEST - <N:C>=1111
                                        ; ***************************************************************************
                                        ;
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION
                                        ;
                                        ;ROM SEQ:       [112,353,354,355,356,357,016] FC 1,5
                                        ;
                                        ;ACT BUTS:      37[004]100,112 / 16[356]016,016
                                        ;
                                        ;EXEC:          [355] D = #B0662+2  /  [356] D = 125252  /  [357] D = #A0662
                                        ;
                                        ;CODES:         N:C = 1111 (NO CHANGE)
                                        ;
                                        ;SYNC:          B05J2 (-) T = 2.6 USEC
                                        ;
                                        ;KEY SIG:       K3-6 MARK L  /  K5-5 BC01 H
                                        ;
051526  012700  000662          T0662:  MOV     #0662,R0                ;LOAD R0 WITH TEST NO.
051532  013701  051556                  MOV     @#I0662,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051536  010604                          MOV     SP,R4           ;SAVE SP
051540  012703  125252                  MOV     #125252,R3      ;[R5] SHOULD BE 125252
051544  012705  051602          R0662:  MOV     #A0662,R5               ;MARK GOES TO A0662 VIA [R5]
051550  010337  051570                  MOV     R3,@#B0662      ;INITIALIZE WORD LOADED INTO R5
051554  000277                          SCC                     ;N:C=1111
                                        ;
051556  006404                  I0662:  MARK+4                  ;TEST THE MARK
                                        ;
051560  010406                          MOV     R4,SP           ;RESET SP
051562  104005          E10662: ERROR5                  ;MARK FAILED TO EXECUTE
051564  051544                  R0662                   ;ERROR LOOP RETURN ADDRESS
                                        ;
051566  000435                  BR      00662           ;GO TO SCOPE EXIT
                                        ;
051570  125252          B0662:  125252                  ;THIS WORD SHOULD GET LOADED INTO R5
                                        ;
051572  010406                          MOV     R4,SP           ;RESET SP
051574  104005          E20662: ERROR5                  ;MARK FAILED TO LOAD RC FROM [R5]
051576  051544                  R0662                   ;ERROR LOOP RETURN ADDRESS
                                        ;
051600  000430                  BR      00662           ;GO TO SCOPE EXIT
                                        ;
051602  100003          A0662:  BPL     D0662           ;N:C=1111?
051604  001002                  BNE     D0662
051606  102001                  BVC     D0662
051610  103405                  BCS     C0662
                                        ;
051612  013702  177776          D0662:  MOV     @#PSW,R2        ;SAVE FLAGS IN R2
051616  010406                  MOV     R4,SP           ;RESET SP
051620  104006          E30662: ERROR6                  ;MSRK SET A FLAG -[PSW] IN R2
051622  051544                  R0662                   ;ERROR LOOP RETURN ADDRESS
                                        ;
051624  020627  051572          C0662:  CMP     SP,#B0662+2     ;DID MARK RESET SP?
051630  001405                  BEQ     F0662           ;BR IF YES
051632  010602                  MOV     SP,R2           ;PUT BAD SP IN R2
051634  010406                  MOV     R4,SP           ;RESET SP
```

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.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 550
DBQEA8.CMB      TO662 MARK INSTRUCTION TEST - <N:C>=1111

 22454  051636  104005                E40662: ERROR5                  ;MARK FAILED TO RESET SP -[R2]=SP WAS
 22455  051640  051544                        R0662                   ;ERROR LOOP RETURN ADDRESS
 22456
 22457  051642  000407                        BR      00662           ;GO TO SCOPE EXIT
 22458
 22459  051644  020503                F0662:  CMP     R5,R3           ;DID MARK RESTORE OLD R5
 22460  051646  001404                        BEQ     G0662           ;BR IF YES
 22461
 22462  051650  010502                        MOV     R5,R2           ;[R2]=WAS R5
 22463  051652  010406                        MOV     R4,SP           ;RESET SP
 22464  051654  104007                E50662: ERROR7                  ;MARK FAILED TO RESET R5
 22465  051656  051544                        R0662                   ;ERROR LOOP RETURN
 22466
 22467  051660  010406                G0662:  MOV     R4,SP           ;RESET SP
 22468
 22469  051662  000004                00662:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
22470                                   ; ***************************************************************************
22471                                           .SBTTL T0663 BASIC KW11-L RESPONSE TEST
22472                                   ; ***************************************************************************
22473
22474  051664  012700  000663          T0663:  MOV     #0663,R0                ;LOAD R0 WITH TEST NO.
22475  051670  013701  051722                  MOV     @#I0663,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22476  051674  005737  066636                  TST     @#OPTION        ;IS THE KW11 INSTALLED ??
22477  051700  100023                          BPL     00663           ;BR IF NOT - SKIP THIS TEST
22478  051702  010605                          MOV     SP,R5           ;SAVE SP
22479  051704  012702  177546                  MOV     #LKCSR,R2       ;[R2] = LINE CLOCK ADDRESS
22480  051710  010506                  R0663:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22481  051712  012737  051726  000004          MOV     #A0663,@#4      ;GO TO A0663 IF BUS TIMEOUT
22482  051720  000257                          CCC                     ;SCOPE SYNC
22483
22484  051722  005712                  I0663:  TST     (R2)            ;REFERENCE LKCSR ADDR
22485
22486  051724  000405                          BR      B0663           ;GO TO EXIT
22487
22488  051726  012737  065160  000004  A0663:  MOV     #BERR,@#4       ;RESTORE TIMEOUT VECTOR
22489  051734  104006                  E0663:  ERROR6                  ;LKCSR FAILED TO RESPOND
22490  051736  051710                          R0663                   ;ERROR LOOP RETURN ADDRESS
22491
22492  051740  010506                  B0663:  MOV     R5,SP           ;RESET SP
22493  051742  012737  065160  000004          MOV     #BERR,@#4       ;RESTORE TIMEOUT VECTOR
22494
22495  051750  000004                  00663:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
22496
```

```
22497                                   ; ***************************************************************************
22498                                           .SBTTL T0664 KW11-L TEST - LKCSR BIT 7 SET
22499                                   ; ***************************************************************************
22500
22501  051752  012700  000664          T0664:  MOV     #0664,R0                ;LOAD R0 WITH TEST NO.
22502  051756  013701  052002                  MOV     @#I0664,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22503  051762  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
22504  051766  100012                          BPL     00664           ;BR IF NOT - SKIP THIS TEST
22505  051770  012702  177546                  MOV     #LKCSR,R2       ;DEST ADDR = 177546
22506  051774  012704  000200                  MOV     #200,R4         ;[LKCSR] S / B = 200
22507  052000  000257                  R0664:  CCC                     ;SCOPE SYNC
22508
22509  052002  030412                  I0664:  BIT     R4,(R2)         ;TEST BIT 7 IN LKCSR
22510
22511  052004  001003                          BNE     00664           ;BR IF IT'S SET
22512
22513  052006  011203                          MOV     (R2),R3         ;GET WAS DATA
22514  052010  104000                  E0664:  ERROR                   ;BIT 7 NOT SET IN LKCSR
22515  052012  052000                          R0664                   ;ERROR LOOP RETURN ADDRESS
22516
22517  052014  000004                  00664:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
22518
```

```
22519                                   ; ***************************************************************************
22520                                          .SBTTL T0665 KW11-L TEST - LKCSR BIT 6 CLEAR
22521                                   ; ***************************************************************************
22522
22523  052016  012700  000665          T0665:  MOV     #0665,R0                ;LOAD R0 WITH TEST NO.
22524  052022  013701  052046                  MOV     @#I0665,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22525  052026  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
22526  052032  100013                          BPL     00665           ;BR IF NOT - SKIP THIS TEST
22527  052034  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
22528  052040  012704  000200                  MOV     #200,R4         ;[LKCSR] S / B = 200
22529  052044  000257                  R0665:  CCC                     ;SCOPE SYNC
22530
22531  052046  032712  000100          I0665:  BIT     #100,(R2)       ;TEST BIT 6 IN LKCSR
22532
22533  052052  001403                          BEQ     00665           ;BR IF CLEAR
22534
22535  052054  011203                          MOV     (R2),R3         ;GET WAS DATA
22536  052056  104000                  E0665:  ERROR                   ;BIT 6 (INTR. ENAB.) IN LKCSR WAS SET
22537  052060  052044                          R0665                   ;ERROR LOOP RETURN ADDRESS
22538
22539  052062  000004                  00665:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
22540                                   ; ***************************************************************************
22541                                          .SBTTL T0666 KW11-L TEST - LKCSR BIT 6 SET
22542                                   ; ***************************************************************************
22543
22544  052064  012700  000666          T0666:  MOV     #0666,R0                ;LOAD R0 WITH TEST NO.
22545  052070  013701  052142                  MOV     @#I0666,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22546  052074  005737  066636                  TST     @#OPTION        ;IS THE KW11 INSTALLED ??
22547  052100  100037                          BPL     00666           ;BR IF NOT - SKIP THIS TEST
22548  052102  010605                          MOV     SP,R5           ;SAVE SP
22549  052104  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
22550  052110  012704  000300                  MOV     #300,R4         ;[LKCSR] S / B = 300
22551  052114  012737  052160  000100  R0666:  MOV     #A0666,@#100    ;SET UP LCLK VECTOR IN CASE LOGIC
22552  052122  012737  000340  000102          MOV     #340,@#102      ;FAULT CAUSES ATL INTERRUPT
22553  052130  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22554  052132  012737  000340  177776          MOV     #340,@#PSW      ;SET PRIORITY TO LEVEL 7
22555  052140  000257                          CCC                     ;SCOPE SYNC
22556
22557  052142  052712  000100          I0666:  BIS     #100,(R2)       ;SET BIT 6 IN LKCSR
22558
22559  052146  020412                          CMP     R4,(R2)         ;RESULT CORRECT?
22560  052150  001403                          BEQ     A0666           ;BR IF YES
22561
22562  052152  011203                          MOV     (R2),R3         ;GET WAS DATA
22563  052154  104000          E10666: ERROR                           ;BIT 6 FAILED TO SET IN LKCSR
22564  052156  052114                          R0666                   ;ERROR LOOP RETURN ADDRESS
22565
22566
22567  052160  042737  000102  000100  A0666:  BIC     #102,@#100      ;RESTORE TRAP CATCHER IN KW11-L VECTOR
22568  052166  005037  000102                  CLR     @#102
22569  052172  042712  000100                  BIC     #100,(R2)       ;TURN OF KW11-L INTR. ENAB.
22570  052176  010506                          MOV     R5,SP           ;RESET SP
22571
22572  052200  000004          00666:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
22573
```

```
22574                                   ; ***************************************************************************
22575                                   .SBTTL T0667 KW11-L BASIC INTERRUPT TEST
22576                                   ; ***************************************************************************
22577
22578
22579  052202  012700  000667          T0667:  MOV     #0667,R0                ;LOAD R0 WITH TEST NO.
22580  052206  013701  052256                  MOV     @#I0667,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22581  052212  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
22582  052216  100041                          BPL     00667           ;BR IF NOT - SKIP THIS TEST
22583  052220  010605                          MOV     SP,R5           ;SAVE SP
22584  052222  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
22585  052226  010506                  R0667:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22586  052230  005004                          CLR     R4              ;INITIALIZE TIMER
22587  052232  012737  052276  000100          MOV     #A0667,@#100    ;SET UP LINE CLOCK VECTOR TO T0
22588  052240  012737  000340  000102          MOV     #340,@#102      ;TO A0667 WITH PROCESSOR PRIORITY = 7
22589  052246  005012                          CLR     (R2)            ;CLEAR LKCSR
22590  052250  005037  177776                  CLR     @#PSW           ;SET PRIORITY TO LEVEL 000
22591  052254  000257                          CCC                     ;SCOPE SYNC
22592
22593  052256  052712  000100          I0667:  BIS     #100,(R2)       ;ENABLE LINE CLK INTERRUPT
22594
22595  052262  005304                          DEC     R4              ;WAIT FOR INTR - REPORT ERROR IF
22596  052264  001376                          BNE     .-2             ;R4 GOES TO 000000
22597
22598  052266  042712  000100                  BIC     #100,(R2)       ;TURN OFF INTR. ENAB.
22599  052272  104006                  E0667:  ERROR6                  ;KW11-L FAILED TO INTERRUPT
22600  052274  052226                          R0667                   ;ERROR LOOP RETURN ADDRESS
22601
22602  052276  042712  000100          A0667:  BIC     #100,(R2)       ;TURN OFF INTR. ENAB.
22603  052302  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN KW11-L VECTOR
22604  052310  005037  000102                  CLR     @#102
22605  052314  010506                          MOV     R5,SP           ;RESET SP
22606  052316  005037  177776                  CLR     @#PSW           ;RESET PRIORITY TO LEVEL 0
22607
22608  052322  000004                  00667:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
22609                                   ; ***************************************************************************
22610                                   ;       .SBTTL T0670 RESET TEST - <N:C> = 1111
22611                                   ; ***************************************************************************
22612
22613                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22614
22615                                   ;ROM SEQ:       [127,025,040,043,016] FC 1,6
22616
22617                                   ;ACT BUTS:      37[004]100,127 / 02[025]042,043
22618
22619                                   ;EXEC:          [025] BUT02 TRIGGERS RESET LOGIC ON K5-8
22620
22621                                   ;CODES:         N:C = 1111 (NO CHANGE)
22622
22623                                   ;SYNC:          B05J2 (-) T = 80 MILLISEC
22624
22625                                   ;KEY SIG:       K3-6 RESET L  /  K3-6 HALT+RESET L  /  K5-3 BUT02 H  /  K5-8 RESET RESTA
22626                                                   ;K5-8 INIT*RESET H  /  K5-8 BUS INIT L  /  K5-8 P ENDRESET L  /
22627                                                   ;  K2-8 CLKOFF(1) H
22628
22629
22630  052324  012700  000670           T0670:  MOV     #0670,R0                ;LOAD R0 WITH TEST NO.
22631  052330  013701  052362                   MOV     @#I0670,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22632  052334  012737  000001  066664           MOV     #1,@#ITCNT      ;NO ITERATIONS ON THIS TEST
22633  052342  012702  177564                   MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
22634  052346  012737  000340  177776  R0670:   MOV     #340,@#PSW      ;MAKE PRTY. BITS ALL 1'S
22635  052354  052712  000004                   BIS     #4,(R2)         ;SET THE DL11 MAINT. BIT
22636  052360  000277                           SCC                     ;N:C = 1111
22637
22638  052362  000005           I0670:  RESET                           ;TEST THE RESET - IT SHOULD CLEAR THE DL11 MAINT BIT
22639
22640  052364  013705  177776                   MOV     @#PSW,R5        ;SAVE THE PSW
22641  052370  032712  000004                   BIT     #4,(R2)         ;DID MAINT. BIT CLEAR ??
22642  052374  001404                           BEQ     A0670           ;BR IF YES
22643
22644  052376  042712  000004                   BIC     #4,(R2)         ;MAKE SURE TO TURN OFF MAINT. BIT
22645  052402  104006           E10670: ERROR6                          ;RESET FAILED TO CLEAR MAINT BIT
22646  052404  052346                   R0670                           ;ERROR LOOP RETURN ADDRESS
22647
22648  052406  022705  000357   A0670:  CMP     #357,R5         ;DID RESET ALTER THE PSW ??
22649  052412  001405                           BEQ     B0670           ;BR IF NOT
22650
22651  052414  012704  000357                   MOV     #357,R4         ;[R4] = S/B PSW
22652  052420  010503                           MOV     R5,R3           ;[R3] = WAS PSW
22653  052422  104000           E20670: ERROR                           ;RESET ALTERED THE PSW
22654  052424  052346                   R0670                           ;ERROR LOOP RETURN ADDRESS
22655
22656  052426  005037  177776   B0670:  CLR     @#PSW           ;CLEAR OUT THE PSW
22657  052432  042712  000004                   BIC     #4,(R2)         ;MAKE SURE MAINT BIT IS OFF
22658
22659  052436  000004           00670:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
22660
```

```
22661                                   ; ***************************************************************************
22662                                         .SBTTL T0671 RESET TEST - <N:C> = 0000
22663                                   ; ***************************************************************************
22664
22665                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22666
22667                                   ;ROM SEQ:       [127,025,040,043,016] FC 1,6
22668
22669                                   ;ACT BUTS:      37[004]100,127 / 02[025]042,043
22670
22671                                   ;EXEC:          [025] BUT02 TRIGGERS RESET LOGIC ON K5-8
22672
22673                                   ;CODES:         N:C = 0000 (NO CHANGE)
22674
22675                                   ;SYNC:          B05J2 (-) T = 80 MILLISEC
22676
22677                                   ;KEY SIG:       K3-6 RESET L  /  K3-6 HALT+RESET L  /  K5-3 BUT02 H  /  K5-8 RESET RESTA
22678                                                   ;K5-8 INIT*RESET H  /  K5-8 BUS INIT L  /  K5-8 P ENDRESET L  /
22679                                                   ;  K2-8 CLKOFF (1) H
22680
22681  052440  012700  000671               T0671:  MOV     #0671,R0                ;LOAD R0 WITH TEST NO.
22682  052444  013701  052476                       MOV     @#I0671,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22683  052450  012737  000001  066664               MOV     #1,@#ITCNT      ;NO ITERATIONS ON THIS TEST
22684  052456  012702  177564                       MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
22685  052462  012737  000000  177776  R0671:  MOV     #0,@#PSW        ;MAKE PRTY. BITS ALL 0'S
22686  052470  052712  000004                       BIS     #4,(R2)         ;SET THE DL11 MAINT. BIT
22687  052474  000257                               CCC                     ;N:C = 0000
22688
22689  052476  000005               I0671:  RESET                   ;TEST THE RESET - IT SHOULD CLEAR THE DL11 MAINT BIT
22690
22691  052500  013705  177776                       MOV     @#PSW,R5        ;SAVE THE PSW
22692  052504  032712  000004                       BIT     #4,(R2)         ;DID MAINT. BIT CLEAR ??
22693  052510  001404                               BEQ     A0671           ;BR IF YES
22694
22695  052512  042712  000004                       BIC     #4,(R2)         ;MAKE SURE TO TURN OFF MAINT. BIT
22696  052516  104006               E10671: ERROR6                  ;RESET FAILED TO CLEAR MAINT BIT
22697  052520  052462                       R0671                   ;ERROR LOOP RETURN ADDRESS
22698
22699  052522  022705  000000       A0671:  CMP     #0,R5           ;DID RESET ALTER THE PSW ??
22700  052526  001405                       BEQ     B0671           ;BR IF NOT
22701
22702  052530  012704  000357                       MOV     #357,R4         ;[R4] = S/B PSW
22703  052534  010503                               MOV     R5,R3           ;[R3] = WAS PSW
22704  052536  104000               E20671: ERROR                   ;RESET ALTERED THE PSW
22705  052540  052462                       R0671                   ;ERROR LOOP RETURN ADDRESS
22706
22707  052542  005037  177776       B0671:  CLR     @#PSW           ;CLEAR OUT THE PSW
22708  052546  042712  000004                       BIC     #4,(R2)         ;MAKE SURE MAINT BIT IS OFF
22709
22710  052552  000004               00671:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
22711
```

```
22712                                   ; ***************************************************************************
22713                                          .SBTTL T0672 WAIT INSTRUCTION TEST - [PSW] = 151
22714                                   ; ***************************************************************************
22715
22716                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22717
22718                                   ;ROM SEQ:       [114,015,012,020,021:
22719                                   ;                     INTR.   014,022,023,007,[TRAP MICROROUTINE]
22720                                   ;                 NO  INTR.   017,015,012,020,021,017 ETC. FC 1,10,6,10
22721
22722                                   ;ACT BUTS:      37[004]100,114  /  26[114]010,012  /  25[020]014,014  /  07[022]006,007
22723
22724                                   ;EXEC           BUT 25 IN LOC. 020 SHOULD CAUSE EXIT FROM WAIT LOOP
22725
22726                                   ;CODES:         N / A    /      N:C=1001 (NO CHANGE)
22727
22728                                   ;SYNC:          B05J2   (-)     T=2.24 USEC + INTR. WAIT TIME
22729
22730                                   ;KEY SIG:       K4-5 BRPTR(1) L  /  K3-6 WAIT L  /  K4-6 BRQ H  /  K5-4 -BRSV(0) H
22731
22732  052554  012700  000672          T0672:  MOV     #0672,R0                ;LOAD R0 WITH TEST NO.
22733  052560  013701  052642                  MOV     @#I0672,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22734  052564  010605                          MOV     SP,R5           ;SAVE THE SP
22735  052566  012702  177564                  MOV     #XCSR,R2        ;R2 POINT TO DL11 XCSR
22736  052572  012737  052662  000064  R0672:  MOV     #A0672,@#64     ;GO TO A0672 ON DL11 INTR.
22737  052600  012737  000200  000066          MOV     #200,@#66       ;AT LEVEL 4
22738  052606  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22739  052610  005012                          CLR     (R2)            ;INIT DL11 XCSR
22740  052612  005003                          CLR     R3              ;INIT TIMER
22741
22742  052614  105712                  1$:     TSTB    (R2)            ;DL11 XMIT READY SET ??
22743  052616  100403                          BMI     2$              ;BR IF YES
22744  052620  005303                          DEC     R3              ;COUNT THE TIMER
22745  052622  001374                          BNE     1$              ;BR IF NO TIMEOUT
22746  052624  000441                          BR      E40672          ;GO REPORT TIMEOUT
22747
22748  052626  012737  000140  177776  2$:     MOV     #140,@#PSW      ;SET PSW PRTY BITS TO LEVEL 3
22749  052634  000277                          SCC                     ;N:C=1111
22750  052636  152712  000100                  BISB    #100,(R2)       ;ENAB. DL11 INTR - N:C=1001
22751
22752  052642  000001                  I0672:  WAIT                    ;TEST THE WAIT-GO TO A0672 ON INTR
22753
22754  052644  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT INTR
22755  052652  005012                          CLR     (R2)            ;TURN OFF DL11 INTR ENAB
22756  052654  104006                  E10672: ERROR6                  ;WAIT FAILED TO EXECUTE PROPERLY
22757  052656  052572                          R0672                   ;ERROR LOOP RETURN ADDRESSS
22758  052660  000425                          BR      C0672           ;GO EXIT THIS TEST
22759
22760  052662  042712  000100          A0672:  BIC     #100,(R2)       ;TURN OFF DL11 INTR ENAB
22761  052666  022716  052644                  CMP     #I0672+2,(SP)   ;DID WAIT GET FETCHED ??
22762  052672  001403                          BEQ     B0672           ;BR IF YES
22763
22764  052674  104006                  E20672: ERROR6                  ;WAIT NOT FETCHED PROPERLY
22765  052676  052572                          R0672                   ;ERROR LOOP RETURN ADDRESS
22766  052700  000415                          BR      C0672           ;GO EXIT THE TEST
22767
```

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.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 559
DBQEAB.CMB      T0672 WAIT INSTRUCTION TEST - [PSW] = 151

 22768  052702  022766  000151  000002  B0672:  CMP     #151,2(SP)      ;DID "WAIT" ALTER THE PSW ??
 22769  052710  001411                          BEQ     C0672           ;BR IF YES
 22770
 22771  052712  012704  000151                  MOV     #151,R4         ;[R4] = S/B PSW
 22772  052716  016603  000002                  MOV     2(SP),R3        ;[R3] = WAS PSW
 22773  052722  104000                  E30672: ERROR                   ;"WAIT" ALTERED THE PSW
 22774  052724  052572                          R0672                   ;ERROR LOOP RETURN ADDRESS
 22775  052726  000402                          BR      C0672           ;GOT TO EXIT TEST
 22776
 22777  052730  104006                  E40672: ERROR6                  ;DL11 FAILED TO SET READY ON TIME
 22778  052732  052572                          R0672                   ;ERROR LOOP RETURN ADDRESS
 22779
 22780  052734  010506                  C0672:  MOV     R5,SP           ;RESET THE SP
 22781  052736  005037  177776                  CLR     @#PSW           ;CLEAR OUT THE PSW
 22782  052742  005012                          CLR     (R2)            ;TURN OFF DL11 INTR.
 22783  052744  012737  000066  000064          MOV     #66,@#64        ;RESTORE DL11 VECTOR WITH TRAPCATCHER
 22784  052752  005037  000066                  CLR     @#66
 22785
 22786  052756  000004                  00672:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
 22787
 22788
```

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22789                                   ; ***************************************************************************
22790                                   .SBTTL TO673 WAIT INSTRUCTION TEST - [PSW] = 010
22791                                   ; ***************************************************************************
22792
22793                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
22794
22795                                   ;ROM SEQ:       [114,015,012,020,021:
22796                                   ;                       INTR.   014,022,023,007,[TRAP MICROROUTINE]
22797                                   ;                   NO  INTR.   017,015,012,020,021,017 ETC. FC 1,10,6,10
22798
22799                                   ;ACT BUTS:      37[004]100,114  /  26[114]010,012  /  25[020]014,014  /  07[022]006,007
22800
22801                                   ;EXEC           BUT 25 IN LOC. 020 SHOULD CAUSE EXIT FROM WAIT LOOP
22802
22803                                   ;CODES:         N / A    /      N:C=1000 (NO CHANGE)
22804
22805                                   ;SYNC:          B05J2   (-)     T=2.24 USEC + INTR. WAIT TIME
22806
22807                                   ;KEY SIG:       K4-5 BRPTR(1) L  /  K3-6 WAIT L  /  K4-6 BRQ H  /  K5-4 -BRSV(0) H
22808
22809  052760  012700  000673          TO673:  MOV     #0673,R0                ;LOAD R0 WITH TEST NO.
22810  052764  013701  053046                  MOV     @#I0673,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22811  052770  010605                          MOV     SP,R5           ;SAVE THE SP
22812  052772  012702  177564                  MOV     #XCSR,R2        ;R2 POINT TO DL11 XCSR
22813  052776  012737  053066  000064  R0673:  MOV     #A0673,@#64     ;GO TO A0673 ON DL11 INTR.
22814  053004  012737  000200  000066          MOV     #200,@#66       ;AT LEVEL 4
22815  053012  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22816  053014  005012                          CLR     (R2)            ;INIT DL11 XCSR
22817  053016  005003                          CLR     R3              ;INIT TIMER
22818
22819  053020  105712          1$:     TSTB    (R2)                    ;DL11 XMIT READY SET ??
22820  053022  100403                  BMI     2$                      ;BR IF YES
22821  053024  005303                  DEC     R3                      ;COUNT THE TIMER
22822  053026  001374                  BNE     1$                      ;BR IF NO TIMEOUT
22823  053030  000441                  BR      E40673                  ;GO REPORT TIMEOUT
22824
22825  053032  012737  000000  177776  2$:     MOV     #0,@#PSW        ;SET PSW PRTY BITS TO LEVEL 0
22826  053040  000257                          CCC                     ;N:C=0000
22827  053042  152712  000100                  BISB    #100,(R2)       ;ENAB. DL11 INTR - N:C=1000
22828
22829  053046  000001          I0673:  WAIT                            ;TEST THE WAIT-GO TO A0673 ON INTR
22830
22831  053050  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT INTR
22832  053056  005012                          CLR     (R2)            ;TURN OFF DL11 INTR ENAB
22833  053060  104006          E10673: ERROR6                          ;WAIT FAILED TO EXECUTE PROPERLY
22834  053062  052776                  R0673                           ;ERROR LOOP RETURN ADDRESSS
22835  053064  000425                  BR      C0673                   ;GO EXIT THIS TEST
22836
22837  053066  042712  000100          A0673:  BIC     #100,(R2)       ;TURN OFF DL11 INTR ENAB
22838  053072  022716  053050                  CMP     #I0673+2,(SP)   ;DID WAIT GET FETCHED ??
22839  053076  001403                  BEQ     B0673                   ;BR IF YES
22840
22841  053100  104006          E20673: ERROR6                          ;WAIT NOT FETCHED PROPERLY
22842  053102  052776                  R0673                           ;ERROR LOOP RETURN ADDRESS
22843  053104  000415                  BR      C0673                   ;GO EXIT THE TEST
22844
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.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 561
DBQEAB.CMB      T0673 WAIT INSTRUCTION TEST - [PSW] = 010

 22845  053106  022766  000010  000002  B0673:  CMP     #010,2(SP)      ;DID "WAIT" ALTER THE PSW ??
 22846  053114  001411                          BEQ     C0673           ;BR IF YES
 22847
 22848  053116  012704  000010                  MOV     #010,R4         ;[R4] = S/B PSW
 22849  053122  016603  000002                  MOV     2(SP),R3        ;[R3] = WAS PSW
 22850  053126  104000                  E30673: ERROR                   ;"WAIT" ALTERED THE PSW
 22851  053130  052776                          R0673                   ;ERROR LOOP RETURN ADDRESS
 22852  053132  000402                          BR      C0673           ;GOT TO EXIT TEST
 22853
 22854  053134  104006                  E40673: ERROR6                  ;DL11 FAILED TO SET READY ON TIME
 22855  053136  052776                          R0673                   ;ERROR LOOP RETURN ADDRESS
 22856
 22857  053140  010506                  C0673:  MOV     R5,SP           ;RESET THE SP
 22858  053142  005037  177776                  CLR     @#PSW           ;CLEAR OUT THE PSW
 22859  053146  005012                          CLR     (R2)            ;TURN OFF DL11 INTR.
 22860  053150  012737  000066  000064          MOV     #66,@#64        ;RESTORE DL11 VECTOR WITH TRAPCATCHER
 22861  053156  005037  000066                  CLR     @#66
 22862
 22863  053162  000004                  00673:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
 22864
 22865
 22866
```

```
22867                                   ; ***************************************************************************
22868                                           .SBTTL T0674 BR PRIORITY ARBITRATION TEST - LEVEL 0 USING KW11-L
22869                                   ; ***************************************************************************
22870
22871  053164  012700  000674          T0674:  MOV     #0674,R0                ;LOAD R0 WITH TEST NO.
22872  053170  013701  053240                  MOV     @#I0674,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22873  053174  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
22874  053200  100041                          BPL     0674            ;BR IF NOT - SKIP THIS TEST
22875  053202  010605                          MOV     SP,R5           ;SAVE THE SP
22876  053204  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LCLK
22877  053210  012737  053260  000100          MOV     #A0674,@#100    ;GO TO A0674 ON LCLK INTR
22878  053216  012737  000340  000102          MOV     #340,@#102      ;LOCK OUT INTRS IN LCLK SERV.
22879  053224  010506          R0674:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
22880  053226  005004                  CLR     R4              ;INIT R4 AS TIMER
22881  053230  012737  000000  177776          MOV     #0,@#PSW        ;SET CPU PRTY TO LEVEL 000
22882  053236  000257                          CCC                     ;SCOPE SYNC
22883
22884  053240  052712  000100          I0674:  BIS     #100,(R2)       ;ENABLE LCLK INTR
22885
22886  053244  005304                          DEC     R4              ;COUNT TIMER
22887  053246  001376                          BNE     .-2             ;LCLK SHOULD INTR BEFORE TIMEOUT
22888
22889  053250  042712  000100                  BIC     #100,(R2)       ;TURN OFF INTR ENAB.
22890  053254  104006          E0674:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 0
22891  053256  053224                          R0674                   ;ERROR LOOP RETURN ADDRESS
22892
22893  053260  042712  000100          A0674:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
22894  053264  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
22895  053272  005037  000102                  CLR     @#102
22896  053276  010506                          MOV     R5,SP           ;RESET THE SP
22897  053300  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
22898
22899  053304  000004          0674:   SCOPE                   ;CALL SCOPE LOOP UTILITY
22900
```

```
22901                                   ; ***************************************************************************
22902                                   .SBTTL T0675 BR PRIORITY ARBITRATION TEST - LEVEL 1 USING KW11-L
22903                                   ; ***************************************************************************
22904
22905  053306  012700  000675          T0675:  MOV     #0675,R0                ;LOAD R0 WITH TEST NO.
22906  053312  013701  053362                  MOV     @#I0675,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22907  053316  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
22908  053322  100041                          BPL     00675           ;BR IF NOT - SKIP THIS TEST
22909  053324  010605                          MOV     SP,R5           ;SAVE THE SP
22910  053326  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
22911  053332  012737  053402  000100          MOV     #A0675,@#100    ;IF INTR OCCURS - GO TO A0675
22912  053340  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
22913  053346  010506                  R0675:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
22914  053350  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
22915  053352  012737  000040  177776          MOV     #40,@#PSW       ;SET CPU PRIORITY TO LEVEL 1
22916  053360  000257                          CCC                     ;SCOPE SYNC
22917
22918  053362  052712  000100          I0675:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS
22919
22920  053366  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
22921  053370  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
22922
22923  053372  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
22924  053376  104006                  E0675:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 1
22925  053400  053346                          R0675                   ;ERROR LOOP RETURN ADDRESS
22926
22927  053402  042712  000100          A0675:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
22928  053406  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
22929  053414  005037  000102                  CLR     @#102
22930  053420  010506                          MOV     R5,SP           ;RESET THE SP
22931  053422  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
22932
22933  053426  000004                  00675:  SCOPE                   ;CALL SCOPE LOOP UTILITY
22934
```

```
22935                                   ; ***************************************************************************
22936                                           .SBTTL T0676 BR PRIORITY ARBITRATION TEST - LEVEL 2 USING KW11-L
22937                                   ; ***************************************************************************
22938
22939  053430  012700  000676          T0676:  MOV     #0676,R0                ;LOAD R0 WITH TEST NO.
22940  053434  013701  053504                  MOV     @#I0676,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22941  053440  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
22942  053444  100041                          BPL     00676           ;BR IF NOT - SKIP THIS TEST
22943  053446  010605                          MOV     SP,R5           ;SAVE THE SP
22944  053450  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
22945  053454  012737  053524  000100          MOV     #A0676,@#100    ;IF INTR OCCURS - GO TO A0676
22946  053462  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
22947  053470  010506          ...     R0676:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
22948  053472  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
22949  053474  012737  000100  177776          MOV     #100,@#PSW      ;SET CPU PRIORITY TO LEVEL 2
22950  053502  000257                          CCC                     ;SCOPE SYNC
22951
22952  053504  052712  000100          I0676:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS
22953
22954  053510  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
22955  053512  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
22956
22957  053514  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
22958  053520  104006          E0676:  ERROR6                          ;KW11-L FAILED TO INTR AT LEVEL 2
22959  053522  053470                          R0676                   ;ERROR LOOP RETURN ADDRESS
22960
22961  053524  042712  000100          A0676:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
22962  053530  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
22963  053536  005037  000102                  CLR     @#102
22964  053542  010506                          MOV     R5,SP           ;RESET THE SP
22965  053544  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
22966
22967  053550  000004          00676:  SCOPE                           ;CALL SCOPE LOOP UTILITY
22968
```

```
22969                                   ; ***************************************************************************
22970                                   ;       .SBTTL T0677 BR PRIORITY ARBITRATION TEST - LEVEL 3 USING KW11-L
22971                                   ; ***************************************************************************
22972
22973  053552  012700  000677          T0677:  MOV     #0677,R0                ;LOAD R0 WITH TEST NO.
22974  053556  013701  053626                  MOV     @#I0677,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
22975  053562  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
22976  053566  100041                          BPL     00677           ;BR IF NOT - SKIP THIS TEST
22977  053570  010605                          MOV     SP,R5           ;SAVE THE SP
22978  053572  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
22979  053576  012737  053646  000100          MOV     #A0677,@#100    ;IF INTR OCCURS - GO TO A0677
22980  053604  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
22981  053612  010506                  R0677:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
22982  053614  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
22983  053616  012737  000140  177776          MOV     #140,@#PSW      ;SET CPU PRIORITY TO LEVEL 3
22984  053624  000257                          CCC                     ;SCOPE SYNC
22985
22986  053626  052712  000100          I0677:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS
22987
22988  053632  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
22989  053634  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
22990
22991  053636  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
22992  053642  104006                  E0677:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 3
22993  053644  053612                          R0677                   ;ERROR LOOP RETURN ADDRESS
22994
22995  053646  042712  000100          A0677:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
22996  053652  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
22997  053660  005037  000102                  CLR     @#102
22998  053664  010506                          MOV     R5,SP           ;RESET THE SP
22999  053666  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23000
23001  053672  000004          00677:  SCOPE                           ;CALL SCOPE LOOP UTILITY
23002
```

```
23003                                   ; ***************************************************************************
23004                                   ;       .SBTTL T0700 BR PRIORITY ARBITRATION TEST - LEVEL 4 USING KW11-L
23005                                   ; ***************************************************************************
23006
23007  053674  012700  000700          T0700:  MOV     #0700,R0                ;LOAD R0 WITH TEST NO.
23008  053700  013701  053750                  MOV     @#I0700,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23009  053704  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
23010  053710  100041                          BPL     00700           ;BR IF NOT - SKIP THIS TEST
23011  053712  010605                          MOV     SP,R5           ;SAVE THE SP
23012  053714  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
23013  053720  012737  053770  000100          MOV     #A0700,@#100    ;IF INTR OCCURS - GO TO A0700
23014  053726  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
23015  053734  010506                  R0700:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23016  053736  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23017  053740  012737  000200  177776          MOV     #200,@#PSW      ;SET CPU PRIORITY TO LEVEL 4
23018  053746  000257                          CCC                     ;SCOPE SYNC
23019
23020  053750  052712  000100          I0700:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS
23021
23022  053754  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
23023  053756  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23024
23025  053760  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23026  053764  104006                  E0700:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 4
23027  053766  053734                          R0700                   ;ERROR LOOP RETURN ADDRESS
23028
23029  053770  042712  000100          A0700:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23030  053774  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
23031  054002  005037  000102                  CLR     @#102
23032  054006  010506                          MOV     R5,SP           ;RESET THE SP
23033  054010  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23034
23035  054014  000004                  00700:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23036
```

```
23037                                   ; ***************************************************************
23038                                           .SBTTL T0701 BR PRIORITY ARBITRATION TEST - LEVEL 5 USING KW11-L
23039                                   ; ***************************************************************
23040
23041  054016  012700  000701          T0701:  MOV     #0701,R0                ;LOAD R0 WITH TEST NO.
23042  054022  013701  054072                  MOV     @#I0701,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23043  054026  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
23044  054032  100041                          BPL     00701           ;BR IF NOT - SKIP THIS TEST
23045  054034  010605                          MOV     SP,R5           ;SAVE THE SP
23046  054036  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
23047  054042  012737  054112  000100          MOV     #A0701,@#100    ;IF INTR OCCURS - GO TO A0701
23048  054050  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
23049  054056  010506                  R0701:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23050  054060  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23051  054062  012737  000240  177776          MOV     #240,@#PSW      ;SET CPU PRIORITY TO LEVEL 5
23052  054070  000257                          CCC                     ;SCOPE SYNC
23053
23054  054072  052712  000100          I0701:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS
23055
23056  054076  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
23057  054100  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23058
23059  054102  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23060  054106  104006          E0701:  ERROR6                          ;KW11-L FAILED TO INTR AT LEVEL 5
23061  054110  054056                  R0701                           ;ERROR LOOP RETURN ADDRESS
23062
23063  054112  042712  000100          A0701:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23064  054116  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
23065  054124  005037  000102                  CLR     @#102
23066  054130  010506                          MOV     R5,SP           ;RESET THE SP
23067  054132  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23068
23069  054136  000004          00701:  SCOPE                           ;CALL SCOPE LOOP UTILITY
23070
```

```
23071                                   ; ***************************************************************************
23072                                           .SBTTL T0702 BR PRIORITY ARBITRATION TEST - LEVEL 0 USING DL11
23073                                   ; ***************************************************************************
23074
23075  054140  012700  000702        T0702:  MOV     #0702,R0                ;LOAD R0 WITH TEST NO.
23076  054144  013701  054206                MOV     @#I0702,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23077  054150  010605                        MOV     SP,R5           ;SAVE THE SP
23078  054152  012702  177564                MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
23079  054156  012737  054226  000064        MOV     #A0702,@#64     ;IF INTR OCCURS - GO TO A0702
23080  054164  012737  000340  000066        MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23081  054172  010506                R0702:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23082  054174  005004                        CLR     R4              ;INITIALIZE R4 AS TIMER
23083  054176  012737  000000  177776        MOV     #0,@#PSW        ;SET CPU PRIORITY TO LEVEL 0
23084  054204  000257                        CCC                     ;SCOPE SYNC
23085
23086  054206  052712  000100        I0702:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS
23087
23088  054212  005304                        DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
23089  054214  001376                        BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23090
23091  054216  042712  000100                BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23092  054222  104006                E0702:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 0
23093  054224  054172                        R0702                   ;ERROR LOOP RETURN ADDRESS
23094
23095  054226  042712  000100        A0702:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23096  054232  012737  000066  000064        MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
23097  054240  005037  000066                CLR     @#66
23098  054244  010506                        MOV     R5,SP           ;RESET THE SP
23099  054246  005037  177776                CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23100
23101  054252  000004                00702:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23102
```

```
23103                                   ; ***************************************************************
23104                                           .SBTTL T0703 BR PRIORITY ARBITRATION TEST - LEVEL 1 USING DL11
23105                                   ; ***************************************************************
23106
23107  054254  012700  000703          T0703:  MOV     #0703,R0                ;LOAD R0 WITH TEST NO.
23108  054260  013701  054322                  MOV     @#I0703,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23109  054264  010605                          MOV     SP,R5           ;SAVE THE SP
23110  054266  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
23111  054272  012737  054342  000064          MOV     #A0703,@#64     ;IF INTR OCCURS - GO TO A0703
23112  054300  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23113  054306  010506                  R0703:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23114  054310  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23115  054312  012737  000040  177776          MOV     #40,@#PSW       ;SET CPU PRIORITY TO LEVEL 1
23116  054320  000257                          CCC                     ;SCOPE SYNC
23117
23118  054322  052712  000100          I0703:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS
23119
23120  054326  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
23121  054330  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23122
23123  054332  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23124  054336  104006                  E0703:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 1
23125  054340  054306                          R0703                   ;ERROR LOOP RETURN ADDRESS
23126
23127  054342  042712  000100          A0703:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23128  054346  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
23129  054354  005037  000066                  CLR     @#66
23130  054360  010506                          MOV     R5,SP           ;RESET THE SP
23131  054362  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23132
23133  054366  000004                  00703:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23134
```

```
23135                                   ; ***************************************************************
23136                                           .SBTTL T0704 BR PRIORITY ARBITRATION TEST - LEVEL 2 USING DL11
23137                                   ; ***************************************************************
23138
23139  054370  012700  000704          T0704:  MOV     #0704,R0                ;LOAD R0 WITH TEST NO.
23140  054374  013701  054450                  MOV     @#I0704,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23141  054400  032737  020000  066642          BIT     #20000,@#BPTLOC ;BREAKPOINT HALT SET ??
23142  054406  001401                          BEQ     .+4             ;BR IF NOT
23143  054410  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
23144  054412  010605                          MOV     SP,R5           ;SAVE THE SP
23145  054414  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 CSR
23146  054420  012737  054470  000064          MOV     #A0704,@#64     ;IF INTR OCCURS - GO TO A0704
23147  054426  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23148  054434  010506                  R0704:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23149  054436  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23150  054440  012737  000100  177776          MOV     #100,@#PSW      ;SET CPU PRIORITY TO LEVEL 2
23151  054446  000257                          CCC                     ;SCOPE SYNC
23152
23153  054450  052712  000100          I0704:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS
23154
23155  054454  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
23156  054456  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23157
23158  054460  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23159  054464  104006                  E0704:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 2
23160  054466  054434                          R0704                   ;ERROR LOOP RETURN ADDRESS
23161
23162  054470  042712  000100          A0704:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23163  054474  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
23164  054502  005037  000066                  CLR     @#66
23165  054506  010506                          MOV     R5,SP           ;RESET THE SP
23166  054510  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23167
23168  054514  000004                  00704:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23169
```

```
23170                                   ; ***************************************************************
23171                                           .SBTTL T0705 BR PRIORITY ARBITRATION TEST - LEVEL 3 USING DL11
23172                                   ; ***************************************************************
23173
23174  054516  012700  000705          T0705:  MOV     #0705,R0                ;LOAD R0 WITH TEST NO.
23175  054522  013701  054564                  MOV     @#I0705,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23176  054526  010605                          MOV     SP,R5           ;SAVE THE SP
23177  054530  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 CSR
23178  054534  012737  054604  000064          MOV     #A0705,@#64     ;IF INTR OCCURS - GO TO A0705
23179  054542  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23180  054550  010506                  R0705:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23181  054552  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23182  054554  012737  000140  177776          MOV     #140,@#PSW      ;SET CPU PRIORITY TO LEVEL 3
23183  054562  000257                          CCC                     ;SCOPE SYNC
23184
23185  054564  052712  000100          I0705:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS
23186
23187  054570  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
23188  054572  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000
23189
23190  054574  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
23191  054600  104006                  E0705:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 3
23192  054602  054550                          R0705                   ;ERROR LOOP RETURN ADDRESS
23193
23194  054604  042712  000100          A0705:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
23195  054610  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
23196  054616  005037  000066                  CLR     @#66
23197  054622  010506**                        MOV     R5,SP           ;RESET THE SP
23198  054624  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23199
23200  054630  000004                  00705:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
23201                                   ; ***************************************************************************
23202                                           .SBTTL T0706 BR PRIORITY ARBITRATION TEST - LEVEL 7 USING KW11-L
23203                                   ; ***************************************************************************
23204
23205  054632  012700  000706          T0706:  MOV     #0706,R0            ;LOAD R0 WITH TEST NO.
23206  054636  013701  054706                  MOV     @#I0706,R1          ;LOAD R1 WITH TEST INSTRUCTION WORD
23207  054642  005737  066636                  TST     @#OPTION            ;IS KW11-L INSTALLED ??
23208  054646  100042                          BPL     00706               ;BR IF NOT - SKIP THIS TEST
23209  054650  010605                          MOV     SP,R5               ;SAVE THE SP
23210  054652  012702  177546                  MOV     #LKCSR,R2           ;R2 POINTS TO KW11-L CSR
23211  054656  012737  054720  000100          MOV     #A0706,@#100        ;IF INTR OCCURS - GO TO A0706
23212  054664  012737  000340  000102          MOV     #340,@#102          ;WITH CPU PRIORITY AT LEVEL 7
23213  054672  010506                  R0706:  MOV     R5,SP               ;RESET SP FOR ERROR LOOP
23214  054674  005004                          CLR     R4                  ;INITIALIZE R4 AS TIMER
23215  054676  012737  000340  177776          MOV     #340,@#PSW          ;SET CPU PRIORITY TO LEVEL 7
23216  054704  000257                          CCC                         ;SCOPE SYNC
23217
23218  054706  052712  000100          I0706:  BIS     #100,(R2)           ;ENABLE INTERRUPTS
23219
23220  054712  005304                          DEC     R4                  ;COUNT UNTIL [R4] = 000000 - THEN
23221  054714  001376                          BNE     .-2                 ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23222  054716  000404                          BR      B0706               ;GO TO EXIT - ALL OK
23223
23224  054720  042712  000100          A0706:  BIC     #100,(R2)           ;TURN OFF THE INTR ENABLE
23225  054724  104006                  E0706:  ERROR6                      ;INTR OCCURRED WITH CPU AT LEVEL 7
23226  054726  054672                          R0706                       ;ERROR LOOP RETURN ADDRESS
23227
23228  054730  042712  000100          B0706:  BIC     #100,(R2)           ;TURN OFF INTR ENABLE
23229  054734  012737  000102  000100          MOV     #102,@#100          ;RESET THE TRAP CATCHER IN THE VECTOR
23230  054742  005037  000102                  CLR     @#102
23231  054746  010506                          MOV     R5,SP               ;RESET SP JUST IN CASE
23232  054750  005037  177776                  CLR     @#PSW               ;SET CPU PRIORITY BACK TO LEVEL 0
23233
23234  054754  000004                  00706:  SCOPE                       ;CALL SCOPE LOOP UTILITY
23235
```

```
23236                                   ; ***************************************************************************
23237                                           .SBTTL T0707 BR PRIORITY ARBITRATION TEST - LEVEL 6 USING KW11-L
23238                                   ; ***************************************************************************
23239
23240  054756  012700  000707          T0707:  MOV     #0707,R0                ;LOAD R0 WITH TEST NO.
23241  054762  013701  055032                  MOV     @#I0707,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23242  054766  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
23243  054772  100042                          BPL     00707           ;BR IF NOT - SKIP THIS TEST
23244  054774  010605                          MOV     SP,R5           ;SAVE THE SP
23245  054776  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
23246  055002  012737  055044  000100          MOV     #A0707,@#100    ;IF INTR OCCURS - GO TO A0707
23247  055010  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
23248  055016  010506                  R0707:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
23249  055020  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23250  055022  012737  000300  177776          MOV     #300,@#PSW      ;SET CPU PRIORITY TO LEVEL 6
23251  055030  000257                          CCC                     ;SCOPE SYNC
23252
23253  055032  052712  000100          I0707:  BIS     #100,(R2)       ;ENABLE INTERRUPTS
23254
23255  055036  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
23256  055040  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23257  055042  000404                          BR      B0707           ;GO TO EXIT - ALL OK
23258
23259  055044  042712  000100          A0707:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
23260  055050  104006                  E0707:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 6
23261  055052  055016                          R0707                   ;ERROR LOOP RETURN ADDRESS
23262
23263  055054  042712  000100          B0707:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
23264  055060  012737  000102  000100          MOV     #102,@#100      ;RESET THE TRAP CATCHER IN THE VECTOR
23265  055066  005037  000102                  CLR     @#102
23266  055072  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
23267  055074  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23268
23269  055100  000004                  00707:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23270
```

```
23271                                   ; ***************************************************************************
23272                                           .SBTTL T0710 BR PRIORITY ARBITRATION TEST - LEVEL 7 USING DL11
23273                                   ; ***************************************************************************
23274
23275  055102  012700  000710          T0710:  MOV     #0710,R0                ;LOAD R0 WITH TEST NO.
23276  055106  013701  055150                  MOV     @#I0710,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23277  055112  010605                          MOV     SP,R5           ;SAVE THE SP
23278  055114  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
23279  055120  012737  055162  000064          MOV     #A0710,@#64     ;IF INTR OCCURS - GO TO A0710
23280  055126  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23281  055134  010506                  R0710:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
23282  055136  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23283  055140  012737  000340  177776          MOV     #340,@#PSW      ;SET CPU PRIORITY TO LEVEL 7
23284  055146  000257                          CCC                     ;SCOPE SYNC
23285
23286  055150  052712  000100          I0710:  BIS     #100,(R2)       ;ENABLE INTERRUPTS
23287
23288  055154  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
23289  055156  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23290  055160  000404                          BR      B0710           ;GO TO EXIT - ALL OK
23291
23292  055162  042712  000100          A0710:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
23293  055166  104006                  E0710:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 7
23294  055170  055134                          R0710                   ;ERROR LOOP RETURN ADDRESS
23295
23296  055172  042712  000100          B0710:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
23297  055176  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
23298  055204  005037  000066                  CLR     @#66            ;
23299  055210  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
23300  055212  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23301                                           ;
23302  055216  000004          00710:  SCOPE                           ;CALL SCOPE LOOP UTILITY
23303
```

```
23304                                   ; ***************************************************************************
23305                                           .SBTTL T0711 BR PRIORITY ARBITRATION TEST - LEVEL 6 USING DL11
23306                                   ; ***************************************************************************
23307
23308  055220  012700  000711          T0711:  MOV     #0711,R0                ;LOAD R0 WITH TEST NO.
23309  055224  013701  055266                  MOV     @#I0711,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23310  055230  010605                          MOV     SP,R5           ;SAVE THE SP
23311  055232  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
23312  055236  012737  055300  000064          MOV     #A0711,@#64     ;IF INTR OCCURS - GO TO A0711
23313  055244  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23314  055252  010506                  R0711:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
23315  055254  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23316  055256  012737  000300  177776          MOV     #300,@#PSW      ;SET CPU PRIORITY TO LEVEL 6
23317  055264  000257                          CCC                     ;SCOPE SYNC
23318
23319  055266  052712  000100          I0711:  BIS     #100,(R2)       ;ENABLE INTERRUPTS
23320
23321  055272  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
23322  055274  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23323  055276  000404                          BR      B0711           ;GO TO EXIT - ALL OK
23324
23325  055300  042712  000100          A0711:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
23326  055304  104006          E0711:  ERROR6                          ;INTR OCCURRED WITH CPU AT LEVEL 6
23327  055306  055252                  R0711                           ;ERROR LOOP RETURN ADDRESS
23328
23329  055310  042712  000100          B0711:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
23330  055314  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
23331  055322  005037  000066                  CLR     @#66
23332  055326  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
23333  055330  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23334
23335  055334  000004                  00711:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23336
```

```
23337                                   ; ***************************************************************************
23338                                          .SBTTL T0712 BR PRIORITY ARBITRATION TEST - LEVEL 5 USING DL11
23339                                   ; ***************************************************************************
23340
23341  055336  012700  000712          T0712:  MOV     #0712,R0            ;LOAD R0 WITH TEST NO.
23342  055342  013701  055404                  MOV     @#I0712,R1          ;LOAD R1 WITH TEST INSTRUCTION WORD
23343  055346  010605                          MOV     SP,R5               ;SAVE THE SP
23344  055350  012702  177564                  MOV     #XCSR,R2            ;R2 POINTS TO DL11 XCSR
23345  055354  012737  055416  000064          MOV     #A0712,@#64         ;IF INTR OCCURS - GO TO A0712
23346  055362  012737  000340  000066          MOV     #340,@#66           ;WITH CPU PRIORITY AT LEVEL 7
23347  055370  010506                  R0712:  MOV     R5,SP               ;RESET SP FOR ERROR LOOP
23348  055372  005004                          CLR     R4                  ;INITIALIZE R4 AS TIMER
23349  055374  012737  000240  177776          MOV     #240,@#PSW          ;SET CPU PRIORITY TO LEVEL 5
23350  055402  000257                          CCC                         ;SCOPE SYNC
23351
23352  055404  052712  000100          I0712:  BIS     #100,(R2)           ;ENABLE INTERRUPTS
23353
23354  055410  005304                          DEC     R4                  ;COUNT UNTIL [R4] = 000000 - THEN
23355  055412  001376                          BNE     .-2                 ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23356  055414  000404                          BR      B0712               ;GO TO EXIT - ALL OK
23357
23358  055416  042712  000100          A0712:  BIC     #100,(R2)           ;TURN OFF THE INTR ENABLE
23359  055422  104006                  E0712:  ERROR6                      ;INTR OCCURRED WITH CPU AT LEVEL 5
23360  055424  055370                          R0712                       ;ERROR LOOP RETURN ADDRESS
23361
23362  055426  042712  000100          B0712:  BIC     #100,(R2)           ;TURN OFF INTR ENABLE
23363  055432  012737  000066  000064          MOV     #66,@#64            ;RESET THE TRAP CATCHER IN THE VECTOR
23364  055440  005037  000066                  CLR     @#66
23365  055444  010506                          MOV     R5,SP               ;RESET SP JUST IN CASE
23366  055446  005037  177776                  CLR     @#PSW               ;SET CPU PRIORITY BACK TO LEVEL 0
23367
23368  055452  000004                  00712:  SCOPE                       ;CALL SCOPE LOOP UTILITY
23369
```

```
23370                                  ; ***************************************************************************
23371                                        .SBTTL TO713 BR PRIORITY ARBITRATION TEST - LEVEL 4 USING DL11
23372                                  ; ***************************************************************************
23373
23374  055454  012700  000713          TO713:  MOV     #0713,R0                ;LOAD R0 WITH TEST NO.
23375  055460  013701  055522                  MOV     @#I0713,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23376  055464  010605                          MOV     SP,R5           ;SAVE THE SP
23377  055466  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
23378  055472  012737  055534  000064          MOV     #A0713,@#64     ;IF INTR OCCURS - GO TO A0713
23379  055500  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
23380  055506  010506          .--     R0713:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
23381  055510  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
23382  055512  012737  000200  177776          MOV     #200,@#PSW      ;SET CPU PRIORITY TO LEVEL 4
23383  055520  000257                          CCC                     ;SCOPE SYNC
23384
23385  055522  052712  000100          I0713:  BIS     #100,(R2)       ;ENABLE INTERRUPTS
23386
23387  055526  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
23388  055530  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
23389  055532  000404                          BR      B0713           ;GO TO EXIT - ALL OK
23390
23391  055534  042712  000100          A0713:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
23392  055540  104006          E0713:  ERROR6                          ;INTR OCCURRED WITH CPU AT LEVEL 4
23393  055542  055506                  R0713                           ;ERROR LOOP RETURN ADDRESS
23394
23395  055544  042712  000100          B0713:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
23396  055550  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
23397  055556  005037  000066                  CLR     @#66
23398  055562  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
23399  055564  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0
23400
23401  055570  000004          00713:  SCOPE                           ;CALL SCOPE LOOP UTILITY
23402
23403
23404
```

```
23405                                   ; ***************************************************************************
23406                                           .SBTTL T0714 "CLR  @#PSW" ALLOWS IMMEDIATE BR-BG-INTR SEQUENCE
23407                                   ; ***************************************************************************
23408
23409                                   ;THIS TEST VERIFIES THAT IF A "BR" REQUEST IS PENDING WHEN A "CLR  @#PSW"
23410                                   ;IS EXECUTED TO LOWER THE CPU PRIORITY, THE REQUEST IS GRANTED BEFORE
23411                                   ;EXECUTION OF THE INSTRUCTION FOLLOWING THE "CLR"
23412
23413  055572  012700  000714          T0714:  MOV     #0714,R0                ;LOAD R0 WITH THE TEST NO.
23414  055576  013701  055672                  MOV     @#I0714,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23415  055602  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
23416  055606  100053                          BPL     00714           ;SKIP THIS TEST IF NOT
23417  055610  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
23418  055614  010605                          MOV     SP,R5           ;SAVE THE SP
23419  055616  012737  055700  000100          MOV     #A0714,@#100    ;SET UP LCLK VECTOR TO GO TO A0714
23420  055624  012737  000300  000102          MOV     #300,@#102
23421  055632  010506                  R0714:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOPING
23422  055634  005004                          CLR     R4              ;INITIALIZE TIMER FO KW
23423  055636  005003                          CLR     R3              ;CLEAR SOFTWARE FLAG
23424  055640  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT ALL INTRS
23425  055646  052712  000100                  BIS     #100,(R2)       ;ENABLE LCLK INTRS
23426  055652  042712  000200                  BIC     #200,(R2)       ;CLEAR LINE CLOCK READY
23427  055656  105712                  1$:     TSTB    (R2)            ;LCLK READY TO INTR ??
23428  055660  100403                          BMI     2$              ;BR IF YES
23429  055662  005304                          DEC     R4              ;COUNT THE TIMER
23430  055664  001374                          BNE     1$              ;BR IF NO TIMEOUT
23431  055666  000412                          BR      B0714           ;GO REPORT TIMEOUT
23432  055670  000257                  2$:     CCC                     ;SCOPE SYNC
23433
23434  055672  005037  177776          I0714:  CLR     @#PSW           ;ALLOW INTRS - LCLK SHOULD INTERRUPT
23435                                                                  ;BEFORE FETCHING NEXT INSTRUCTION
23436  055676  005103                          COM     R3              ;SHOULD NOT BE FETCHED
23437  055700  005012                  A0714:  CLR     (R2)            ;DISABLE THE LCLK INTR
23438  055702  005703                          TST     R3              ;DID SOFTWARE FLAG GET SET ??
23439  055704  001406                          BEQ     C0714           ;BR IF NOT - IT WORKED OK
23440  055706  104006                  E10714: ERROR6                  ;LCLK FAILED TO INTR ONTIME
23441  055710  055632                          R0714                   ;ERROR LOOP RETURN ADDRESS
23442  055712  000403                          BR      C0714           ;GO EXIT
23443
23444  055714  005012                  B0714:  CLR     (R2)            ;DISABLE  LCLK INTR
23445  055716  104006                  E20714: ERROR6                  ;KW11-L TIMED OUT
23446  055720  055632                          R0714                   ;ERROR LOOP RETURN ADDRESS
23447
23448  055722  010506                  C0714:  MOV     R5,SP           ;RESET THE SP
23449  055724  012737  000102  000100          MOV     #102,@#100      ;RESTORE THE KW11-L TRAPCATCHER
23450  055732  005037  000102                  CLR     @#102
23451
23452  055736  000004                  00714:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
23453                                   ; ***************************************************************************
23454                                   ;       .SBTTL T0715 "BR6 VS BR4" PRIORITY ARBITRATION TEST
23455                                   ; ***************************************************************************
23456
23457                                   ;THIS TEST VERIFIES THAT IF BOTH A "BR4" AND A "BR6" REQUEST ARE
23458                                   ;PENDING WHEN THE CPU PRIORITY IS LOWERED TO ALLOW INTRS. THAT "BR6"
23459                                   ;REQUEST IS GRANTED FIRST EVEN THOUGH THE "BR4" REQUEST MAY HAVE
23460                                   ;OCCURRED FIRST
23461
23462  055740  012700  000715          T0715:  MOV     #0715,R0        ;LOAD R0 WITH THE TEST NO.
23463  055744  013701  056106                  MOV     @#I0715,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23464  055750  005737  066636                  TST     @#OPTION        ;IS THE LCLK INSTALLED ??
23465  055754  100133                          BPL     00715           ;BR IF NOT - SKIP THIS TEST
23466  055756  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
23467  055762  012703  177564                  MOV     #XCSR,R3        ;R3 POINTS TO DL11 XCSR
23468  055766  010605                          MOV     SP,R5           ;SAVE THE SP
23469  055770  012737  056116  000100          MOV     #A0715,@#100    ;SET UP THE LCLK VECTOR - GO TO A0715
23470  055776  012737  000300  000102          MOV     #300,@#102
23471  056004  012737  056152  000064          MOV     #C0715,@#64     ;SET UP THE DL11 VECTOR - GO TO C0715
23472  056012  012737  000200  000066          MOV     #200,@#66
23473  056020  010506                  R0715:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
23474  056022  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT ALL INTRS
23475  056030  005037  067602                  CLR     @#MBUF0         ;INIT TIMER
23476  056034  005037  067606                  CLR     @#MBUF1         ;CLEAR DL11 INTR FLAG
23477  056040  005004                          CLR     R4              ;INIT TIMER
23478  056042  052713  000100                  BIS     #100,(R3)       ;ENABLE DL11 XMIT INTR
23479  056046  105713                  1$:     TSTB    (R3)            ;XMIT READY SET ??
23480  056050  100403                          BMI     2$              ;BR IF YES
23481  056052  005304                          DEC     R4              ;COUNT THE TIMER
23482  056054  001374                          BNE     1$              ;BR IF NO TIMEOUT
23483  056056  000444                          BR      F0715           ;GO REPORT TIMEOUT FOR DL11
23484
23485  056060  005004                  2$:     CLR     R4              ;INIT THE TIMER AGAIN
23486  056062  052712  000100                  BIS     #100,(R2)       ;ENABLE LCLK INTRS
23487  056066  042712  000200                  BIC     #200,(R2)       ;CLEAR THE LINE CLOCK READY BIT
23488  056072  105712                  3$:     TSTB    (R2)            ;LCLK READY TO INTR
23489  056074  100403                          BMI     4$              ;BR IF YES
23490  056076  005304                          DEC     R4              ;COUNT THE TIMER
23491  056100  001374                          BNE     3$              ;BR IF NO TIMEOUT
23492  056102  000437                          BR      G0715           ;GO REPORT KW11-L TIMEOUT
23493  056104  000257                  4$:     CCC                     ;SCOPE SYNC
23494
23495  056106  005037  177776          I0715:  CLR     @#PSW           ;ALLOW INTRS - KW SHOULD INTR FIRST
23496
23497  056112  005137  067602                  COM     @#MBUF0         ;SET SOFTWARE FLAG IF FETCHED
23498  056116  005013                  A0715:  CLR     (R3)            ;DISABLE BOTH INTERRUPTS
23499  056120  005012                          CLR     (R2)
23500  056122  005737  067602                  TST     @#MBUF0         ;DID SOFTWARE FLAG GET SET ??
23501  056126  001403                          BEQ     B0715           ;BR IF NOT
23502
23503  056130  104007                  E10715: ERROR7                  ;KW11-L INTR OCCURRED TOO LATE
23504  056132  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS
23505  056134  000426                          BR      H0715           ;GO TO EXIT
23506
23507  056136  005737  067606          B0715:  TST     @#MBUF1         ;DID DL11 SOFTWARE FLAG SET ??
23508  056142  001423                          BEQ     H0715           ;BR IF NOT
```

```
23509
23510  056144  104007                  E20715: ERROR7                  ;DL11 INTERRUPTED THE KW11
23511  056146  056020                          R0715                   ;ERROR LOOP RETURN ADDDRESS
23512  056150  000420                          BR      H0715           ;GO TO EXIT TEST
23513
23514  056152  005137  067606          C0715:  COM     @#MBUF1         ;FLAG THE DL11 INTR
23515  056156  005013                          CLR     (R3)            ;DISABLE BOTH INTR ENABLES
23516  056160  005012                          CLR     (R2)
23517  056162  104007                  E30715: ERROR7                  ;DL11 SHOULD NOT HAVE INTERRUPTED
23518  056164  056020                          R0715                   ;ERROR LOOP RETURN ADDDRESS
23519  056166  000411                          BR      H0715           ;GO EXIT TEST
23520
23521  056170  005012                  F0715:  CLR     (R2)            ;DISABLE THE INTR ENABLES
23522  056172  005013                          CLR     (R3)
23523  056174  104007                  E40715: ERROR7                  ;DL11 TIMEOUT
23524  056176  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS
23525  056200  000404                          BR      H0715           ;GO TO EXIT
23526
23527  056202  005012                  G0715:  CLR     (R2)            ;DISABLE INTR ENABLES
23528  056204  005013                          CLR     (R3)
23529  056206  104007                  E50715: ERROR7                  ;KW11 TIMEOUT
23530  056210  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS
23531
23532  056212  010506                  H0715:  MOV     R5,SP           ;RESET THE SP
23533  056214  005037  177776                  CLR     @#PSW           ;RESET THE CPU PRIORITY
23534  056220  012737  000102  000100        MOV     #102,@#100      ;RESTORE LCLK VECTOR
23535  056226  005037  000102                  CLR     @#102
23536  056232  012737  000066  000064        MOV     #66,@#64        ;RESTORE THE DL11 XMIT VECTOR
23537  056240  005037  000066                  CLR     @#66
23538
23539  056244  000004                  00715:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
23540
```

```
23541                                   ; ***************************************************************************
23542                                   ; //////////////COMBINED INSTRUCTION EXERCISER SECTION //////////////
23543                                   ; ***************************************************************************
23544
23545                                   ; ***************************************************************************
23546                                   ;       .SBTTL T0716 "BPT" TRAP LINKAGE TEST
23547                                   ; ***************************************************************************
23548
23549  056246  012700  000716      T0716:  MOV     #0716,R0                ;SAVE THE TEST NO. IN R0
23550  056252  013701  056272              MOV     @#I0716,R1      ;LOAD INSTRUCTION TEST WORD INTO R1
23551  056256  010605                      MOV     SP,R5           ;SAVE THE SP
23552  056260  012737  056300  000014      MOV     #A0716,@#14     ;GO TO A0716 ON "BPT" TRAP
23553  056266  010506              R0716:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOPING
23554  056270  000257                      CCC                     ;SCOPE SYNC
23555
23556  056272  000003              I0716:  BPT                     ;TEST THE "BPT" - GO TO A0716
23557
23558  056274  104005              E0716:  ERROR5                  ;BPT FAILED TO TRAP
23559  056276  056266                      R0716                   ;ERROR LOOP RETURN ADDRESS
23560
23561  056300  010506              A0716:  MOV     R5,SP           ;RESET THE SP
23562  056302  012737  000016  000014      MOV     #16,@#14        ;RESTORE THE VECTOR
23563
23564  056310  000004              00716:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
23565
23566
23567                                   ; ***************************************************************************
23568                                   ;       .SBTTL T0717 RED ZONE OVERFLOW TEST - MOV R,-(SP)
23569                                   ; ***************************************************************************
23570
23571                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
23572
23573                                   ;ROM SEQ:       [174,257,200,JAMUPP,TRAP MICROROUTINE] FC 1,4,6,10
23574
23575                                   ;ACT BUTS:      37[004]100,174 / 22[174]200,200 / 01[332]122,123 / 26[123]010,013
23576
23577                                   ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC
23578
23579                                   ;CODES:         N / A
23580
23581                                   ;SYNC:          B05J2 (-) T = 10 USEC
23582
23583                                   ;KEY SIG:       K5-5 STACK04 H  /  K5-5 STPM2 H  /  K1-7 BOVFLW STOP H  /  K4-4 OVFLW ER
23584                                                   ;K4-4 BUS STOP H  /  K4-3 JBERR (1) L  /  K4-3 JAMUPP L  /  K4-3 JAM CLK
23585
23586  056312  012700  000717      T0717:  MOV     #0717,R0                ;LOAD R0 WITH TEST NO.
23587  056316  013701  056356              MOV     @#I0717,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23588  056322  010605                      MOV     SP,R5           ;SAVE SP
23589  056324  013704  000004      R0717:  MOV     @#4,R4          ;SAVE T.O. VECTOR
23590  056330  013703  000336              MOV     @#336,R3        ;SAVE VECTOR AT 336
23591  056334  012737  056372  000004      MOV     #A0717,@#4      ;GO TO A0717 ON OVFLW
23592  056342  012737  125252  000336      MOV     #125252,@#336   ;INIT. [336]
23593  056350  012706  000340              MOV     #340,SP         ;SET SP TO CAUSE RED ZONE TRAP
23594  056354  000257                      CCC                     ;SCOPE SYNC
23595
23596  056356  010046              I0717:  MOV     R0,-(SP)        ;FORCE RED ZONE TRAP - GO TO A0717
```

DBQEAB.CMB T0717 RED ZONE OVERFLOW TEST - MOV R,-(SP)

```
23597
23598  056360  010437  000004                  MOV     R4,@#4          ;RESTORE T.O. VECTOR
23599  056364  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
23600  056366  104005                  E10717: ERROR5                  ;MOV FAILED TO CAUSE TRAP
23601  056370  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS
23602
23603  056372  010437  000004          A0717:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
23604  056376  022706  000000                  CMP     #0,SP           ;[SP]=0?
23605  056402  001403                          BEQ     B0717           ;BE IF YES
23606
23607  056404  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
23608  056406  104005                  E20717: ERROR5                  ;SP NOT BEING JAMMED TO 4
23609  056410  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS
23610
23611  056412  022737  125252  000336  B0717:  CMP     #125252,@#336   ;DID PUSH OCCUR IN YELLOW ZONE?
23612  056420  001403                          BEQ     C0717           ;BR IF NOT
23613
23614  056422  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
23615  056424  104005                  E30717: ERROR5                  ;MOV PUSHED INTO YELLOW ZONE
23616  056426  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS
23617
23618  056430  010337  000336          C0717:  MOV     R3,@#336        ;RESTORE VECTOR 336
23619  056434  010506                          MOV     R5,SP           ;RESET SP
23620
23621  056436  000004                  00717:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
23622
```

```
23623                                   ; ***************************************************************************
23624                                          .SBTTL T0720 YELLOW ZONE OVERFLOW TEST - MOV R,-(SP)
23625                                   ; ***************************************************************************
23626
23627                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
23628
23629                                   ;ROM SEQ:       [174,257,201,125,375,017,015,010,TRAP MICROROUTINE] FC 1,4,8,10,6
23630
23631                                   ;ACT BUTS:      37[004]100,174 / 22[174]200,201 / 16[125]016,017 / 26[017]010,010
23632
23633                                   ;EXEC:          K4-4 CLK BOVFL SETS K5-4 BOVFLW FLOP
23634
23635                                   ;CODES:         N/A
23636
23637                                   ;SYNC:          B05J2   (-)     T= 10USEC
23638
23639                                   ;KEY SIG:       K4-4 CLK BOVFLW H / K4-4 CKOVF H / K1-7 BOVFL L
23640
23641  056440  012700  000720           T0720:  MOV     #0720,R0                ;LOAD R0 WITH TEST NO.
23642  056444  013701  056476                   MOV     @#I0720,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23643  056450  010605                           MOV     SP,R5           ;SAVE SP
23644  056452  012702  000376                   MOV     #376,R2         ;R2 POINTS TO STACK
23645  056456  013704  000004           R0720:  MOV     @#4,R4          ;SAVE T.O. VECTOR
23646  056462  012737  056512  000004           MOV     #A0720,@#4      ;ON OVFLW - GO TO A0720
23647  056470  012706  000400                   MOV     #400,SP         ;SET SP TO CAUSE OVFLW
23648  056474  000257                           CCC                     ;SCOPE SYNC
23649
23650  056476  010046           I0720:  MOV     R0,-(SP)        ;FORCE STACK OVFLW - GO TO A0720
23651
23652  056500  010437  000004                   MOV     R4,@#4          ;RESTORE T.O. VECTOR
23653  056504  010506                           MOV     R5,SP           ;RESET SP FOR ERROR CALL
23654  056506  104005           E10720: ERROR5                  ;STACK OVFLW FAILED TO TRAP
23655  056510  056456                   R0720                   ;ERROR LOOP RETURN ADDRESS
23656
23657  056512  010437  000004           A0720:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
23658  056516  020012                           CMP     R0,(R2)         ;DID [R0] GET PUSHED?
23659  056520  001403                           BEQ     B0720           ;BR IF YES
23660
23661  056522  010506                           MOV     R5,SP           ;RESET SP FOR ERROR CALL
23662  056524  104005           E20720: ERROR5                  ;MOV FAILED TO PUSH IN YELLOW ZONE
23663  056526  056456                   R0720                   ;ERROR LOOP RETURN ADDRESS
23664
23665  056530  005706           B0720:  TST     SP              ;[SP]=0?
23666  056532  001003                   BNE     C0720           ;BR IF NOT
23667
23668  056534  010506                           MOV     R5,SP           ;RESET SP FOR ERROR CALL
23669  056536  104005           E30720: ERROR5                  ;RED ZONE INSTEAD OF YELLOW ZONE
23670  056540  056456                   R0720                   ;ERROR LOOP RETURN ADDRESS
23671
23672  056542  010506           C0720:  MOV     R5,SP           ;RESET SP
23673
23674  056544  000004           00720:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 584
DBQEAB.CMB      T0720 YELLOW ZONE OVERFLOW TEST - MOV R,-(SP)

23675                                   ; ***************************************************************************
23676                                           .SBTTL T0721 YELLOW ZONE OVERFLOW TEST - (CMP  R0,-(SP))
23677                                   ; ***************************************************************************
23678
23679  056546  012700  000721          T0721:  MOV     #0721,R0                ;LOAD R0 WITH TEST NO.
23680  056552  013701  056600                  MOV     @#I0721,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23681  056556  010605                          MOV     SP,R5           ;SAVE THE SP
23682  056560  013704  000004                  MOV     @#4,R4          ;SAVE TRAP VECTOR
23683  056564  012737  056604  000004  R0721:  MOV     #A0721,@#4      ;GO TO A0721 IF TRAP SPRUNG
23684  056572  012706  000400                  MOV     #400,SP         ;SET SP TO PUSH INTO "YELLOW ZONE"
23685  056576  000257                          CCC                     ;SCOPE SYNC
23686
23687  056600  020046          I0721:  CMP     R0,-(SP)        ;TEST THE CMP - NO TRAP SHOULD OCCUR
23688
23689  056602  000405                  BR      B0721           ;GO TO EXIT TEST
23690
23691  056604  010437  000004  A0721:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
23692  056610  010506                  MOV     R5,SP           ;RESET THE SP
23693  056612  104005          E0721:  ERROR5                  ;CMP CAUSED OVERFLOW TRAP
23694  056614  056564                  R0721                   ;ERROR LOOP RETURN ADDRESS
23695
23696  056616  010437  000004  B0721:  MOV     R4,@#4          ;RESTORE THE VECTOR
23697  056622  010506                  MOV     R5,SP           ;RESET THE SP
23698
23699  056624  000004          00721:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
23700                                   ; ***************************************************************************
23701                                          .SBTTL T0722 YELLOW ZONE OVERFLOW TEST - (BIT  R0,-(SP))
23702                                   ; ***************************************************************************
23703
23704  056626  012700  000722          T0722:  MOV     #0722,R0                ;LOAD R0 WITH TEST NO.
23705  056632  013701  056660                  MOV     @#I0722,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23706  056636  010605                          MOV     SP,R5           ;SAVE THE SP
23707  056640  013704  000004                  MOV     @#4,R4          ;SAVE TRAP VECTOR
23708  056644  012737  056664  000004  R0722:  MOV     #A0722,@#4      ;GO TO A0722 IF TRAP SPRUNG
23709  056652  012706  000400                  MOV     #400,SP         ;SET SP TO PUSH INTO "YELLOW ZONE"
23710  056656  000257                          CCC                     ;SCOPE SYNC
23711
23712  056660  030046          I0722:  BIT     R0,-(SP)        ;TEST THE BIT - NO TRAP SHOULD OCCUR
23713
23714  056662  000405                  BR      B0722           ;GO TO EXIT TEST
23715
23716  056664  010437  000004  A0722:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
23717  056670  010506                  MOV     R5,SP           ;RESET THE SP
23718  056672  104005          E0722:  ERROR5                  ;BIT CAUSED OVERFLOW TRAP
23719  056674  056644                  R0722                   ;ERROR LOOP RETURN ADDRESS
23720
23721  056676  010437  000004  B0722:  MOV     R4,@#4          ;RESTORE THE VECTOR
23722  056702  010506                  MOV     R5,SP           ;RESET THE SP
23723
23724  056704  000004          00722:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
23725                                  ; ***************************************************************************
23726                                          .SBTTL T0723 YELLOW ZONE OVERFLOW TEST - (TST  -(SP))
23727                                  ; ***************************************************************************
23728
23729  056706  012700  000723         T0723:  MOV     #0723,R0                ;LOAD R0 WITH TEST NO.
23730  056712  013701  056740                 MOV     @#I0723,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23731  056716  010605                         MOV     SP,R5           ;SAVE THE SP
23732  056720  013704  000004                 MOV     @#4,R4          ;SAVE TRAP VECTOR
23733  056724  012737  056744  000004 R0723:  MOV     #A0723,@#4      ;GO TO A0723 IF TRAP SPRUNG
23734  056732  012706  000400                 MOV     #400,SP         ;SET SP TO PUSH INTO "YELLOW ZONE"
23735  056736  000257                         CCC                     ;SCOPE SYNC
23736
23737  056740  005746         I0723:  TST     -(SP)           ;TEST THE TST - NO TRAP SHOULD OCCUR
23738
23739  056742  000405                 BR      B0723           ;GO TO EXIT TEST
23740
23741  056744  010437  000004 A0723:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
23742  056750  010506                 MOV     R5,SP           ;RESET THE SP
23743  056752  104005         E0723:  ERROR5                  ;TST CAUSED OVERFLOW TRAP
23744  056754  056724                 R0723                   ;ERROR LOOP RETURN ADDRESS
23745
23746  056756  010437  000004 B0723:  MOV     R4,@#4          ;RESTORE THE VECTOR
23747  056762  010506                 MOV     R5,SP           ;RESET THE SP
23748
23749  056764  000004         00723:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
23750                                   ; ***************************************************************************
23751                                           .SBTTL T0724 ODD ADDRESS ERROR TEST - SUB  RA,(RB) - (RB) = ODD
23752                                   ; ***************************************************************************
23753
23754                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
23755
23756                                   ;ROM SEQ:
23757
23758                                   ;ACT BUTS:
23759
23760                                   ;EXEC:
23761
23762                                   ;CODES:
23763
23764                                   ;SYNC:
23765
23766                                   ;KEY SIG:
23767
23768  056766  012700  000724          T0724:  MOV     #0724,R0                ;LOAD R0 WITH TEST NO.
23769  056772  013701  057022                  MOV     @#I0724,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
23770  056776  010605                          MOV     SP,R5           ;SAVE SP
23771  057000  013704  000004          R0724:  MOV     @#4,R4          ;SAVE T.O. VECTOR
23772  057004  012737  057034  000004          MOV     #A0724,@#4      ;ON ODD ADDR ERROR - GO TO A0724
23773  057012  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
23774  057014  012702  000001                  MOV     #1,R2           ;R2 GETS ODD ADDRESS
23775  057020  000257                          CCC                     ;SCOPE SYNC
23776
23777  057022  160012          I0724:  SUB     R0,(R2)         ;FORCE ODD ADDR ERROR - GO TO A0724
23778
23779  057024  010437  000004                  MOV     R4,@#4          ;RESTORE T.O. VECTOR
23780  057030  104005          E0724:  ERROR5                  ;ODD ADDR FAILED TO TRAP
23781  057032  057000                  R0724                   ;ERROR LOOP RETURN ADDRESS
23782
23783  057034  010437  000004  A0724:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
23784  057040  010506                  MOV     R5,SP           ;RESET SP
23785  057042  005037  000000                  CLR     @#0             ;CLR LOC. 0 JUST IN CASE
23786
23787  057046  000004          0O724:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
23788
```

```
23789                                   ; ***************************************************************************
23790                                           .SBTTL T0725 TEST FOR ODD ADDR. ERROR TRAP FOR DEST. DEFERRED MODES
23791                                   ; ***************************************************************************
23792
23793  057050  012700  000725          T0725:  MOV     #0725,R0                ;LOAD R0 WITH TEST NO.
23794  057054  012702  067607                  MOV     #MBUF1+1,R2     ;DEST ADDR=MBUF1+1 (ODD)
23795  057060  012737  057154  000004          MOV     #A0725,@#4      ;GO TO A0725 ON ODA TRAP
23796
23797  057066  010205                  R10725: MOV     R2,R5           ;[R5] = DEST. ADDR
23798  057070  013701  057076                  MOV     @#I10725,R1     ;[R1] = TEST INSTR
23799  057074  000257                          CCC                     ;SCOPE SYNC
23800
23801  057076  105435                  I10725: NEGB    @(R5)+          ;TEST DM=3 TRAP
23802
23803  057100  104006                  E10725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 163
23804  057102  057066                          R10725                  ;ERROR LOOP RETURN ADDRESS
23805
23806  057104  012705  067611          R20725: MOV     #MBUF1+3,R5     ;[R5] = DEST. ADDR
23807  057110  013701  057116                  MOV     @#I20725,R1     ;[R1] = TEST INSTR
23808  057114  000257                          CCC                     ;SCOPE SYNC
23809
23810  057116  105455                  I20725: NEGB    @-(R5)          ;TEST DM=5 TRAP
23811
23812  057120  104006                  E20725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 165
23813  057122  057104                          R20725                  ;ERROR LOOP RETURN ADDRESS
23814
23815  057124  010205                  R30725: MOV     R2,R5           ;[R5] = DEST ADDR
23816  057126  013701  057134                  MOV     @#I30725,R1     ;[R1] = TEST INSTR
23817  057132  000257                          CCC                     ;SCOPE SYNC
23818
23819  057134  105475  000000          I30725: NEGB    @0(R5)          ;TEST DM=7 TRAP
23820
23821  057140  104006                  E30725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 263
23822  057142  057124                          R30725                  ;ERROR LOOP RETURN ADDRESS
23823
23824  057144  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
23825  057152  000403                          BR      00725           ;GO TO SCOPE EXIT
23826
23827  057154  062716  000004          A0725:  ADD     #4,(SP)         ;MOV RETURN PC AROUND ERROR CALL
23828  057160  000002                          RTI                     ;RETURN TO NEXT SUB-TEST
23829
23830  057162  000004                  00725:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23831
```

```
23832                                   ; ***************************************************************************
23833                                   .SBTTL T0726 TEST FOR ODD ADDR ERROR TRAP FOR SOURCE DEFERRED MODES
23834                                   ; ***************************************************************************
23835
23836  057164  012700  000726          T0726:  MOV     #0726,R0                ;LOAD R0 WITH TEST NO.
23837  057170  012702  067607                  MOV     #MBUF1+1,R2     ;[R2] = SOURCE ADDR. (ODD)
23838  057174  012737  057270  000004          MOV     #A0726,@#4      ;GO TO A0726 ON TRAP
23839
23840  057202  010205                  R10726: MOV     R2,R5           ;[R5] = SOURCE ADDR.
23841  057204  013701  057212                  MOV     @#I10726,R1     ;[R1] = TEST INSTR.
23842  057210  000257                          CCC                     ;SCOPE SYNC
23843
23844  057212  113504                  I10726: MOVB    @(R5)+,R4       ;TEST SM=3
23845
23846  057214  104006                  E10726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 143
23847  057216  057202                          R10726                  ;ERROR LOOP RETURN ADDRESS
23848
23849  057220  012705  067611          R20726: MOV     #MBUF1+3,R5     ;[R5] = SOURCE ADDR
23850  057224  013701  057232                  MOV     @#I20726,R1     ;[R1] = TEST INSTR
23851  057230  000257                          CCC                     ;SCOPE SYNC
23852
23853  057232  115504                  I20726: MOVB    @-(R5),R4       ;TEST SM=5
23854
23855  057234  104006                  E20726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 145
23856  057236  057220                          R20726                  ;ERROR LOOP RETURN ADDRESS
23857  057240  010205                  R30726: MOV     R2,R5           ;[R5] = SOURCE ADDR
23858  057242  013701  057250                  MOV     @#I30726,R1     ;[R1] = TEST INSTR
23859  057246  000257                          CCC                     ;SCOPE SYNC
23860
23861  057250  117504  000000          I30726: MOVB    @0(R5),R4       ;TEST SM=7
23862
23863  057254  104006                  E30726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 244
23864  057256  057240                          R30726                  ;ERROR LOOP RETURN ADDRESS
23865
23866  057260  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
23867  057266  000403                          BR      00726           ;GO TO SCOPE EXIT
23868
23869  057270  062716  000004          A0726:  ADD     #4,(SP)         ;MOVE RETURN PC AROUND ERROR CALL
23870  057274  000002                          RTI                     ;RETURN TO NEXT SUB-TEST
23871
23872  057276  000004                  00726:  SCOPE                   ;CALL SCOPE LOOP UTILITY
23873
23874
23875
```

```
23876                                   ; ***************************************************************************
23877                                   .SBTTL T0727 TEST FOR ODD ADDR ERROR TRAP FOR JMP DEST DEFERRED MODES
23878                                   ; ***************************************************************************
23879
23880  057300  012700  000727          T0727:  MOV     #0727,R0                ;LOAD R0 WITH TEST NO.
23881  057304  012702  057407                  MOV     #B0727+3,R2     ;DEST ADDR = B0727+3 (ODD)
23882  057310  012737  057412  000004          MOV     #A0727,@#4      ;GO TO A0727 ON ODA TRAP
23883
23884  057316  010205                  R10727: MOV     R2,R5           ;[R5] = DEST ADDR
23885  057320  013701  057326                  MOV     @#I10727,R1     ;[R1] = TEST INSTR
23886  057324  000257                          CCC                     ;SCOPE SYNC
23887
23888  057326  000135                  I10727: JMP     @(R5)+          ;TEST JMP DM=3
23889
23890  057330  104006                  E10727: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 153
23891  057332  057316                          R10727                  ;ERROR LOOP RETURN ADDRESS
23892
23893  057334  012705  057407          R20727: MOV     #B0727+3,R5     ;[R5] = DEST ADDR
23894  057340  013701  057346                  MOV     @#I20727,R1     ;[R1] = TEST INSTR
23895  057344  000257                          CCC                     ;SCOPE SYNC
23896
23897  057346  000155                  I20727: JMP     @-(R5)          ;TEST JMP DM=5
23898
23899  057350  104006                  E20727: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 155
23900  057352  057334                          R20727                  ;ERROR LOOP RETURN ADDRESS
23901
23902  057354  010205                  R30727: MOV     R2,R5           ;[R5] = DEST ADDR
23903  057356  013701  057364                  MOV     @#I30727,R1     ;[R1] = TEST INSTR
23904  057362  000257                          CCC                     ;SCOPE SYNC
23905
23906  057364  000175  000000          I30727: JMP     @0(R5)          ;TEST JMP DM=7
23907
23908  057370  104006                  E30727: ERROR6                  ;ODA TRAP NOT SPRUNG IN LOC 302
23909  057372  057354                          R30727                  ;ERROR LOOP RETURN ADDRESS
23910
23911  057374  012737  065160  000004          MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR
23912  057402  000421                          BR      00727           ;GO TO SCOPE EXIT
23913
23914  057404  000000          B0727:  HALT                            ;CATASTOPHIC ERROR - [PC] QUESTIONABLE.
23915  057406  000000                  HALT                            ;RESTART PROGRAM - DO NOT CONTINUE.
23916  057410  000000                  HALT
23917
23918  057412  032716  000001          A0727:  BIT     #1,(SP)         ;TRAP DUE TO ODD PC?
23919  057416  001003                          BNE     C0727           ;BR IF YES
23920  057420  062716  000004                  ADD     #4,(SP)         ;MOV RETURN PC AROUND ERROR CALL
23921  057424  000002                          RTI                     ;RETURN TO NEXT SUB TEST
23922
23923  057426  011603          C0727:  MOV     (SP),R3         ;GET ODD PC OFF STACK INTO R3
23924  057430  062706  000004                  ADD     #4,SP           ;FIX SP
23925
23926  057434  104007          E40727: ERROR7                  ;PC TRAPPED WITH ODD ADDRESS
23927  057436  057300                  T0727
23928
23929  057440  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
23930
23931  057446  000004          00727:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

DBQEAB.CMB TD727 TEST FOR ODD ADDR ERROR TRAP FOR JMP DEST DEFERRED MODES

23932

```
23933                                   ; ***************************************************************************
23934                                   ;       .SBTTL T0730 TEST FOR STACK OFLW FOR DEST MODES 1,2,4, AND 6.
23935                                   ; ***************************************************************************
23936
23937  057450  012700  000730          T0730:  MOV     #0730,R0                ;LOAD R0 WITH TEST NO.
23938  057454  012737  057602  000004          MOV     #A0730,@#4      ;GO TO A0730 ON OVFLW TRAP
23939  057462  010605                  MOV     SP,R5           ;SAVE SP
23940  057464  012702  000376          MOV     #376,R2         ;USE R2 TO SET UP SP TO CAUSE TRAP
23941
23942  057470  013701  057500          R10730: MOV     @#I10730,R1     ;[R1] = TEST INSTR.
23943  057474  010206                  MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
23944  057476  000257                  CCC                     ;SCOPE SYNC
23945
23946  057500  005016                  I10730: CLR     (SP)            ;TEST DM1 - SHOULD SPRING TRAP
23947
23948  057502  010506                  MOV     R5,SP           ;RESET SP
23949  057504  104006                  E10730: ERROR6                  ;DM1 FAILED TO CAUSE OVERFLOW TRAP
23950  057506  057470                  R10730                  ;ERROR LOOP RETURN ADDRESS
23951
23952  057510  013701  057520          R20730: MOV     @#I20730,R1     ;[R1] = TEST INSTR.
23953  057514  010206                  MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
23954  057516  000257                  CCC                     ;SCOPE SYNC
23955
23956  057520  005026                  I20730: CLR     (SP)+           ;TEST DM2 - SHOULD SPRING TRAP
23957
23958  057522  010506                  MOV     R5,SP           ;RESET SP
23959  057524  104006                  E20730: ERROR6                  ;DM2 FAILED TO CAUSE OVERFLOW TRAP
23960  057526  057510                  R20730                  ;ERROR LOOP RETURN ADDRESS
23961
23962  057530  013701  057540          R30730: MOV     @#I30730,R1     ;[R1] = TEST INSTR.
23963  057534  010206                  MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
23964  057536  000257                  CCC                     ;SCOPE SYNC
23965
23966  057540  005046                  I30730: CLR     -(SP)           ;TEST DM4 - SHOULD SPRING TRAP
23967
23968  057542  010506                  MOV     R5,SP           ;RESET SP
23969  057544  104006                  E30730: ERROR6                  ;DM4 FAILED TO CAUSE OVERFLOW TRAP
23970  057546  057530                  R30730                  ;ERROR LOOP RETURN ADDRESS
23971
23972  057550  013701  057560          R40730: MOV     @#I40730,R1     ;[R1] = TEST INSTR.
23973  057554  010206                  MOV     R2,SP           ;SET SP TO CAUSE ERROR
23974  057556  000257                  CCC                     ;SCOPE SYNC
23975
23976  057560  005066  000000          I40730: CLR     0(SP)           ;TEST DM6 - SHOULD SPRING TRAP
23977
23978  057564  010506                  MOV     R5,SP           ;RESET SP
23979  057566  104006                  E40730: ERROR6                  ;DM6 FAILED TO CAUSE OVERFLOW TRAP
23980  057570  057550                  R40730                  ;ERROR LOOP RETURN ADDRESS
23981
23982  057572  012737  065160  000004          MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR
23983  057600  000407                  BR      00730           ;GO TO SCOPE EXIT
23984
23985  057602  011604                  A0730:  MOV     (SP),R4         ;GET RETURN PC OFF STACK
23986  057604  062704  000006          ADD     #6,R4           ;MOVE RETURN PC AROUND ERROR CALL
23987  057610  010506                  MOV     R5,SP           ;RESET SP
23988  057612  005046                  CLR     -(SP)           ;PUSH NEW PS ON STACK
```

```
 23989  057614  010446                          MOV     R4,-(SP)        ;PUSH RETURN PC ON STACK
 23990  057616  000002                          RTI                     ;RETURN TO NEXT SUB-TEST
 23991
 23992  057620  000004                  00730:  SCOPE                   ;CALL SCOPE LOOP UTILITY
 23993
```

```
23994                                   ; ***************************************************************************
23995                                           .SBTTL T0731 TEST FOR STACK OVFLW FOR MOV DEST MODES 1,2,4, AND 6.
23996                                   ; ***************************************************************************
23997
23998  057622  012700  000731          T0731:  MOV     #0731,R0                ;LOAD R0 WITH TEST NO.
23999  057626  012737  057754  000004          MOV     #A0731,@#4      ;GO TO A0731 ON STACK OVFLW TRAP
24000  057634  010605                          MOV     SP,R5           ;SAVE SP
24001  057636  012702  000376                  MOV     #376,R2         ;USE R2 TO SET UP SP TO CAUSE TRAP
24002
24003  057642  013701  057652          R10731: MOV     @#I10731,R1     ;[R1] = TEST INSTR.
24004  057646  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
24005  057650  000257                          CCC                     ;SCOPE SYNC
24006
24007  057652  010016          I10731: MOV     R0,(SP)         ;TEST MOV DM1 - SHOULD SPRING TRAP
24008
24009  057654  010506                          MOV     R5,SP           ;RESET SP
24010  057656  104006          E10731: ERROR6                  ;MOV DM1 FAILED TO SPRING TRAP
24011  057660  057642                          R10731                  ;ERROR LOOP RETURN ADDRESS
24012
24013  057662  013701  057672          R20731: MOV     @#I20731,R1     ;[R1] = TEST INSTR.
24014  057666  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
24015  057670  000257                          CCC                     ;SCOPE SYNC
24016
24017  057672  010026          I20731: MOV     R0,(SP)+        ;TEST MOV DM2 - SHOULD SPRING TRAP
24018
24019  057674  010506                          MOV     R5,SP           ;RESET SP
24020  057676  104006          E20731: ERROR6                  ;MOV DM2 FAILED TO SPRING TRAP
24021  057700  057662                          R20731                  ;ERROR LOOP RETURN ADDRESS
24022
24023  057702  013701  057712          R30731: MOV     @#I30731,R1     ;[R1] = TEST INSTR.
24024  057706  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
24025  057710  000257                          CCC                     ;SCOPE SYNC
24026
24027  057712  010046          I30731: MOV     R0,-(SP)        ;TEST MOV DM4 - SHOULD SPRING TRAP
24028
24029  057714  010506                          MOV     R5,SP           ;RESET SP
24030  057716  104006          E30731: ERROR6                  ;MOV DM4 FAILED TO SPRING TRAP
24031  057720  057702                          R30731                  ;ERROR LOOP RETURN ADDRESS
24032
24033  057722  013701  057732          R40731: MOV     @#I40731,R1     ;[R1] = TEST INSTR.
24034  057726  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
24035  057730  000257                          CCC                     ;SCOPE SYNC
24036
24037  057732  010066  000000          I40731: MOV     R0,0(SP)        ;TEST MOV DM6 - SHOULD SPRING TRAP
24038
24039  057736  010506                          MOV     R5,SP           ;RESET SP
24040  057740  104006          E40731: ERROR6                  ;MOV DM6 FAILED TO CAUSE OVFLW TRAP
24041  057742  057722                          R40731                  ;ERROR LOOP RETURN ADDRESS
24042
24043  057744  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
24044  057752  000407                          BR      00731           ;GO TO SCOPE EXIT
24045
24046  057754  011604          A0731:  MOV     (SP),R4         ;GET RETURN PC
24047  057756  062704  000006                  ADD     #6,R4           ;MOVE RETURN PC AROUND ERROR CALL
24048  057762  010506                          MOV     R5,SP           ;RESET SP
24049  057764  005046                          CLR     -(SP)           ;PUSH NEW PSW
```

```
24050  057766  010446                          MOV     R4,-(SP)        ;PUSH RETURN PC
24051  057770  000002                          RTI                     ;RETURN TO NEXT SUB-TEST
24052
24053  057772  000004                  00731:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24054
```

```
24055                                   ; ***************************************************************************
24056                                           .SBTTL T0732 TEST THAT JSR CAN CAUSE OVERFLOW TRAP
24057                                   ; ***************************************************************************
24058
24059  057774  012700  000732          T0732:  MOV     #0732,R0                ;LOAD R0 WITH TEST NO.
24060  060000  012737  060036  000004          MOV     #A0732,@#4      ;GO TO A0732 ON OVERFLOW ERROR
24061  060006  010605                          MOV     SP,R5           ;SAVE SP
24062  060010  013701  060022                  MOV     @#I0732,R1      ;LOAD R1 WITH TEST INSTR WORD
24063  060014  012706  000400          R0732:  MOV     #400,SP         ;SET THE SP TO CAUSE TRAP
24064  060020  000257                          CCC                     ;SCOPE SYNC
24065
24066  060022  004737  060042          I0732:  JSR     PC,@#B0732      ;TEST JSR - SHOULD SPRING TRAP
24067
24068  060026  010506                          MOV     R5,SP           ;RESET SP
24069  060030  104005                  E10732: ERROR5                  ;JSR PUSH DID NOT SPRING OVFL TRAP
24070  060032  060014                          R0732                   ;ERROR LOOP RETURN ADDRESS
24071
24072  060034  000405                          BR      C0732           ;GO TO SCOPE EXIT
24073
24074  060036  010506                  A0732:  MOV     R5,SP           ;RESET SP
24075  060040  000403                          BR      C0732           ;GO EXIT TEST - ALL OK
24076
24077  060042  010506                  B0732:  MOV     R5,SP           ;RESET SP
24078  060044  104005                  E20732: ERROR5                  ;JSR PUSH FAILED TO SPRING OVFLW TRAP
24079  060046  060014                          R0732                   ;ERROR LOOP RETURN ADDRESS
24080
24081  060050  012737  065160  000004  C0732:  MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR
24082
24083  060056  000004                  00732:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24084
```

```
24085                                   ; ***************************************************************************
24086                                           .SBTTL T0733 TEST THAT 1ST PUSH IN TRAP MICROROUTINE CAUSES OVFLW TRAP
24087                                   ; ***************************************************************************
24088
24089  060060  012700  000733          T0733:  MOV     #0733,R0                ;LOAD R0 WITH TEST NO.
24090  060064  013704  000014                  MOV     @#14,R4         ;SAVE BREAK POINT TRAP VECTOR
24091  060070  013701  060120                  MOV     @#I0733,R1      ;LOAD R1 WITH TEST INSTR
24092  060074  010605                          MOV     SP,R5           ;SAVE SP
24093  060076  012737  060132  000004          MOV     #A0733,@#4      ;GO TO A0733 ON OVFLW TRAP
24094  060104  012737  060136  000014          MOV     #B0733,@#14     ;GO TO B0733 IF BPT SERVICED
24095  060112  012706  000400          R0733:  MOV     #400,SP         ;SET UP SP TO CAUSE OVFLW ON 1ST PUSH
24096  060116  000257                          CCC                     ;SCOPE SYNC
24097
24098  060120  000003                  I0733:  BPT                     ;TEST THE BPT - SHOULD CAUSE OVERFLOW TRAP
24099
24100  060122  010506                          MOV     R5,SP           ;RESET SP
24101  060124  104005                  E10733: ERROR5                  ;BPT FAILED TO TRAP
24102  060126  060112                          R0733                   ;ERROR LOOP RETURN ADDRESS
24103
24104  060130  000405                          BR      C0733           ;GO TO SCOPE EXIT
24105
24106  060132  010506                  A0733:  MOV     R5,SP           ;RESET SP
24107  060134  000403                          BR      C0733           ;GO EXIT - ALL OK
24108
24109  060136  010506                  B0733:  MOV     R5,SP           ;RESET SP
24110  060140  104005                  E20733: ERROR5                  ;OVFLW TRAP FAILED TO BUMP BPT SERVICE
24111  060142  060112                          R0733                   ;ERROR LOOP RETURN ADDRESS
24112
24113  060144  012737  065160  000004  C0733:  MOV     #BERR,@#4       ;RESET VECTORS
24114  060152  010437  000014                  MOV     R4,@#14
24115
24116  060156  000004                  00733:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24117
```

```
24118                                   ; ************************************************************************
24119                                           .SBTTL T0734 TEST THAT 2ND PUSH IN TRAP MICROUTINE CAUSES OVFLW TRAP
24120                                   ; ************************************************************************
24121
24122  060160  012700  000734          T0734:  MOV     #0734,R0                ;LOAD R0 WITH TEST NO.
24123  060164  013701  060220                  MOV     @#I0734,R1      ;LOAD R1 WITH TEST INSTR WORD
24124  060170  013704  000014                  MOV     @#14,R4         ;SAVE BPT VECTOR
24125  060174  010605                          MOV     SP,R5           ;SAVE SP
24126  060176  012737  060232  000004          MOV     #A0734,@#4      ;GO TO A0734 ON STACK OVFLOW
24127  060204  012737  060236  000014          MOV     #B0734,@#14     ;GO TO B0734 IF BPT SERVICED
24128  060212  012706  000402          R0734:  MOV     #402,SP         ;SET SP TO CAUSE TRAP ON 2ND PUSH
24129  060216  000257                          CCC                     ;SCOPE SYNC
24130
24131  060220  000003          I0734:  BPT                             ;TEST THE BPT - SHOULD CAUSE OVERFLOW TRAP
24132
24133  060222  010506                          MOV     R5,SP           ;RESET SP
24134  060224  104005          E10734: ERROR5                          ;BPT FAILED TO TRAP
24135  060226  060212                  R0734                           ;ERROR LOOP RETURN ADDRESS
24136
24137  060230  000405                          BR      C0734           ;GO TO SCOPE EXIT
24138
24139  060232  010506          A0734:  MOV     R5,SP           ;RESET SP
24140  060234  000403                  BR      C0734           ;GO EXIT - ALL OK
24141
24142  060236  010506          B0734:  MOV     R5,SP           ;RESET SP
24143  060240  104005          E20734: ERROR5                  ;OVFLW TRAP FAILED TO BUMP BPT SERVICE
24144  060242  060212                  R0734                   ;ERROR LOOP RETURN ADDRESS
24145
24146  060244  012737  065160  000004  C0734:  MOV     #BERR,@#4       ;RESET VECTORS
24147  060252  010437  000014                  MOV     R4,@#14
24148
24149  060256  000004          00734:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
24150                                   ; ***************************************************************************
24151                                          .SBTTL T0735 ILLEGAL INSTRUCTION TEST - JSR RN,%R
24152                                   ; ***************************************************************************
24153
24154                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24155
24156                                   ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10
24157
24158                                   ;ACT BUTS:      37[004]100,150 / 01[332]122,123 / 26[123]010,013
24159
24160                                   ;EXEC:          [115] D = NEW PSW  /  [113] D = OLD PSW  /  [331] D = #I0735+2  /  [333]
24161
24162                                   ;CODES:         [140] SPS=7  /  N:C = [LOC 6]
24163
24164                                   ;SYNC:          B05J2 (-) T = 5.8 USEC
24165
24166                                   ;KEY SIG:       K3-6 ILL INSTR L  /  K5-5 STPM3 H  /  K3-3 DM=0L  /  K3-5 JMP+JSR H
24167
24168  060260  012700  000735          T0735:  MOV     #0735,R0                ;LOAD R0 WITH TEST NO.
24169  060264  013701  060314                  MOV     @#I0735,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24170  060270  010605                          MOV     SP,R5           ;SAVE SP
24171  060272  013704  000004          R0735:  MOV     @#4,R4          ;SAVE T.O. VECTOR
24172  060276  012737  060326  000004          MOV     #A0735,@#4      ;ILLEGAL INSTR. TRAP GOES TO A0735
24173  060304  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
24174  060306  012702  060322                  MOV     #E0735,R2               ;IN CASE JSR JUMPS TO [R2]
24175  060312  000257                          CCC                     ;SCOPE SYNC
24176
24177  060314  004302                  I0735:  JSR     R3,R2           ;JSR MODE 0 FORCES TRAP - GO TO A0735
24178
24179  060316  010437  000004                  MOV     R4,@#4          ;RESTORE T.O. VECTOR
24180  060322  104005                  E0735:  ERROR5                  ;JSR FAILED TO SPRING TRAP
24181  060324  060272                          R0735                   ;ERROR LOOP RETURN ADDRESS
24182
24183  060326  010437  000004          A0735:  MOV     R4,@#4          ;RESTORE VECTOR
24184  060332  010506                          MOV     R5,SP           ;RESET SP
24185
24186  060334  000004                  00735:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24187
```

```
24188                                   ; ***************************************************************************
24189                                   .SBTTL T0736 ILLEGAL INSTRUCTION TEST - JMP %R
24190                                   ; ***************************************************************************
24191
24192                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24193
24194                                   ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10
24195
24196                                   ;ACT BUTS:      37[004]100,150 / 01[332]122,123 / 26[123]010,013
24197
24198                                   ;EXEC:          [115] D = NEW PSW  /  [113] D = OLD PSW  /  [311] D = #I0736+2  /  [333]
24199
24200                                   ;CODES:         [140] SPS=7  /  N:C = [LOC 6]
24201
24202                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24203
24204                                   ;KEY SIG:       K3-6 ILL INSTR L  /  K5-5 STPM3 H  /  K3-3 DM=0L  /  K3-5 JMP+JSR H
24205
24206  060336  012700  000736          T0736:  MOV     #0736,R0                ;LOAD R0 WITH TEST NO.
24207  060342  013701  060372                  MOV     @#I0736,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24208  060346  010605                          MOV     SP,R5           ;SAVE SP
24209  060350  013704  000004          R0736:  MOV     @#4,R4          ;SAVE VECTOR POINTER AT LOC. 4
24210  060354  012737  060404  000004         MOV     #A0736,@#4      ;ON TRAP - GO TO A0736
24211  060362  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
24212  060364  012702  060400                  MOV     #E0736,R2               ;IN CASE IT JUMPS TO ADDR IN RN
24213  060370  000257                          CCC                     ;SCOPE SYNC
24214
24215  060372  000102                  I0736:  JMP     R2              ;JMP MODE 0 FORCES TRAP - GO TO A0736
24216
24217  060374  010437  000004                  MOV     R4,@#4          ;RESTORE VECTOR POINTER AT LOC. 4
24218  060400  104005                  E0736:  ERROR5                  ;ILLEGAL INSTR TRAP FAILED
24219  060402  060350                          R0736                   ;ERROR LOOP RETURN ADDRESS
24220
24221  060404  010437  000004          A0736:  MOV     R4,@#4          ;RESTORE VECTOR POINTER AT LOC. 4
24222  060410  010506                          MOV     R5,SP           ;RESET SP
24223
24224  060412  000004                  00736:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24225                                   ; ***************************************************************************
24226                                          .SBTTL T0737 BUS TIMEOUT TRAP TEST - TST (R)
24227                                   ; ***************************************************************************
24228
24229                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24230
24231                                   ;ROM SEQ:
24232
24233                                   ;ACT BUTS:
24234
24235                                   ;EXEC:
24236
24237                                   ;CODES:
24238
24239                                   ;SYNC:
24240
24241                                   ;KEY SIG:
24242
24243  060414  012700  000737           T0737:  MOV     #0737,R0            ;LOAD R0 WITH TEST NO.
24244  060420  013701  060450                   MOV     @#I0737,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24245  060424  010605                   R0737:  MOV     SP,R5           ;SAVE SP
24246  060426  013704  000004                   MOV     @#4,R4          ;SAVE ORIGINAL T.O. VECTOR POINTER
24247  060432  012737  060462  000004           MOV     #A0737,@#4      ;ON T.O. TRAP - GO TO A0737
24248  060440  012702  160000                   MOV     #160000,R2      ;R3 ADDRESS CAUSES T.O.
24249  060444  010506                           MOV     R5,SP           ;RESET SP FOR ERROR LOOP
24250  060446  000257                           CCC                     ;SCOPE SYNC
24251
24252  060450  005712                   I0737:  TST     (R2)            ;FORCE T.O. TRAP - GO TO A0737
24253
24254  060452  010437  000004                   MOV     R4,@#4          ;RESTORE T.O. VECTOR
24255  060456  104005                   E0737:  ERROR5                  ;TIMEOUT TRAP FAILED
24256  060460  060426                           R0737                   ;ERROR LOOP RETURN ADDRESS
24257  060462  010437  000004           A0737:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
24258  060466  010506                           MOV     R5,SP           ;RESET SP
24259
24260  060470  000004                   00737:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24261
```

```
24262                                   ; ***************************************************************************
24263                                           .SBTTL T0740 "T" BIT TRAP TEST
24264                                   ; ***************************************************************************
24265
24266                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24267
24268                                   ;ROM SEQ:       [104,373,362,002,015,010,216,215,115,326,327,113,330,331
24269                                                   ;077,140,332,333,123,015,013] FC 1,7,8,10,6,10
24270                                   ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,002 / 26[002]010,010
24271                                                   ;01[332]122,123 / 26[123]010,013
24272                                   ;EXEC:          [362] BUPP = 002 ("T" BIT TRAP)
24273
24274                                   ;CODES:         N / A
24275
24276                                   ;SYNC:          B05J2 (-) T = 8 USEC
24277
24278                                   ;KEY SIG:       K5-2 PS(T)(1) H  /  K5-5 STPM3 H  /  K5-5 STPM2 H
24279
24280  060472  012700  000740          T0740:  MOV     #0740,R0                ;LOAD R0 WITH TEST NO.
24281  060476  013701  060530                  MOV     @#I0740,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24282  060502  010605                          MOV     SP,R5           ;SAVE SP
24283  060504  010506                  R0740:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
24284  060506  012737  060540  000014          MOV     #A0740,@#14     ;GO TO A0740 WHEN "T" TRAP SPRUNG
24285  060514  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT ON STACK
24286  060520  012746  060530                  MOV     #I0740,-(SP)    ;SET UP NEW PC ON STACK
24287  060524  000257                          CCC                     ;SCOPE SYNC
24288  060526  000006                          RTT                     ;TURN ON "T" BIT - GO TO I0740
24289
24290  060530  005700                  I0740:  TST     R0              ;SPRING "T" BIT TRAP - GO TO A0740
24291
24292  060532  104005                  E10740: ERROR5                  ;NO "T" BIT TRAP OCCURRED
24293  060534  060504                          R0740                   ;ERROR LOOP RETURN ADDRESS
24294
24295  060536  000406                          BR      B0740           ;GO EXIT
24296
24297  060540  032766  000020  000002  A0740:  BIT     #20,2(SP)       ;"T" BIT SET IN OLD PSW?
24298  060546  001002                          BNE     B0740           ;BR IF YES
24299
24300  060550  104000                  E20740: ERROR                   ;#T# BIT NOT SAVED ON STACK
24301  060552  060504                          R0740                   ;ERROR LOOP RETURN ADDRESS
24302
24303  060554  012737  000016  000014  B0740:  MOV     #16,@#14        ;RESTORE "T" BIT TRAP CATCHER
24304  060562  005037  000016                  CLR     @#16
24305  060566  010506                          MOV     R5,SP           ;RESET SP
24306
24307  060570  000004                  00740:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24308                                   ; ************************************************************************
24309                                           .SBTTL T0741 TEST PUSH INTO PSW WITH [SP] = 000000
24310                                   ; ************************************************************************
24311
24312                                   ;THESE NEXT TWO TESTS VERIFY THAT A "RED ZONE" TRAP OCCURS IF A
24313                                   ;PUSH IS ATTEMPTED WITH THE [SP] INITIALLY EQUAL TO 000000,177572,
24314
24315                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24316
24317                                   ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
24318                                                   ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
24319                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
24320                                                   ; / 26[123]010,013
24321
24322                                   ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC
24323
24324                                   ;CODES:         N / A
24325
24326                                   ;SYNC:          BOSJ2 (-) T = 10 USEC
24327
24328                                   ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP H  /  K4-4 OVFLW ERR L  /  K4-3 JBERR
24329                                                   ; K4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04
24330
24331  060572  012700  000741          T0741:  MOV     #0741,R0                ;LOAD R0 WITH TEST NO.
24332  060576  013701  060622                  MOV     @#I0741,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
24333  060602  010605                          MOV     SP,R5           ;SAVE THE SP
24334  060604  013704  000004          R0741:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
24335  060610  012737  060646  000004          MOV     #A0741,@#4      ;"RED ZONE" TRAP GOES TO A0741
24336  060616  005006                          CLR     SP              ;MAKE SP = 000000
24337  060620  000257                          CCC                     ;SCOPE SYNC
24338
24339  060622  012746  177777          I0741:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO PSW - SHOULD CAUSE
24340                                                                  ;"RED ZONE" TRAP TO BE SPRUNG
24341
24342  060626  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24343  060632  005004                          CLR     R4              ;[R4] = S / B SP
24344  060634  010603                          MOV     SP,R3           ;[R3] = WAS SP
24345  060636  010506                          MOV     R5,SP           ;RESET THE SP
24346  060640  104000          E10741: ERROR                           ;TRAP NOT SPRUNG
24347  060642  060604                  R0741                           ;ERROR LOOP RETURN ADDRESS
24348  060644  000413                  BR      00741                   ;GO TO SCOPE EXIT - SCHOOL'S OUT
24349
24350  060646  022706  000000          A0741:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
24351  060652  001407                  BEQ     B0741                   ;BR IF YES
24352
24353  060654  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24354  060660  005004                          CLR     R4              ;[R4]= S / B SP
24355  060662  010603                          MOV     SP,R3           ;[R3] = WAS SP
24356  060664  010506                          MOV     R5,SP           ;RESET THE SP
24357  060666  104000          E20741: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
24358  060670  060604                  R0741                           ;ERROR LOOP RETURN ADDRESS
24359
24360  060672  010506          B0741:  MOV     R5,SP           ;FIX UP THE SP
24361
24362  060674  000004          00741:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24363
```

```
24364                                   ; ***************************************************************************
24365                                   .SBTTL T0742 TEST PUSH INTO SR WITH [SP] = 177572
24366                                   ; ***************************************************************************
24367
24368                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24369
24370                                   ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
24371                                                   ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
24372                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
24373                                                   ; / 26[123]010,013
24374
24375                                   ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC
24376
24377                                   ;CODES:         N / A
24378
24379                                   ;SYNC:          B05J2 (-) T = 10 USEC
24380
24381                                   ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP  /  K4-4 OVFLW ERR L  /  K4-3 JBERR(1
24382                                                   ;4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04 H
24383
24384
24385  060676  012700  000742          T0742:  MOV     #0742,R0                ;LOAD R0 WITH TEST NO.
24386  060702  013701  060730                  MOV     @#I0742,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
24387  060706  010605                          MOV     SP,R5           ;SAVE THE SP
24388  060710  013704  000004          R0742:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
24389  060714  012737  060754  000004          MOV     #A0742,@#4      ;"RED ZONE" TRAP GOES TO A0742
24390  060722  012706  177572                  MOV     #177572,SP      ;MAKE SP=177572
24391  060726  000257                          CCC                     ;SCOPE SYNC
24392
24393  060730  012746  177777          I0742:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO SR - SHOULD CAUSE
24394                                                                  ;"RED ZONE" TRAP TO BE SPRUNG
24395
24396  060734  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24397  060740  005004                          CLR     R4              ;[R4] = S / B SP
24398  060742  010603                          MOV     SP,R3           ;[R3] = WAS SP
24399  060744  010506                          MOV     R5,SP           ;RESET THE SP
24400  060746  104000          E10742: ERROR                           ;TRAP NOT SPRUNG
24401  060750  060710                  R0742                           ;ERROR LOOP RETURN ADDRESS
24402  060752  000413                  BR      00742                   ;GO TO SCOPE EXIT - SCHOOL'S OUT
24403
24404  060754  022706  000000          A0742:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
24405  060760  001407                  BEQ     B0742                   ;BR IF YES
24406
24407  060762  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24408  060766  005004                          CLR     R4              ;[R4]= S / B SP
24409  060770  010603                          MOV     SP,R3           ;[R3] = WAS SP
24410  060772  010506                          MOV     R5,SP           ;RESET THE SP
24411  060774  104000          E20742: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
24412  060776  060710                  R0742                           ;ERROR LOOP RETURN
24413
24414  061000  010506          B0742:  MOV     R5,SP           ;FIX UP THE SP
24415
24416  061002  000004          00742:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24417                                   ; ***************************************************************************
24418                                           .SBTTL T0743 TEST PUSH INTO SLR WITH [SP] = 177776
24419                                   ; ***************************************************************************
24420
24421                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24422
24423                                   ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
24424                                                   ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
24425                                   ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
24426                                                   ; / 26[123]010,013
24427
24428                                   ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC
24429
24430                                   ;CODES:         N / A
24431
24432                                   ;SYNC:          B05J2 (-) T = 10 USEC
24433
24434                                   ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP  /  K4-4 OVFLW ERR L  /  K4-3 JBERR(1
24435                                                   ;4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04 H
24436
24437
24438  061004  012700  000743          T0743:  MOV     #0743,R0                ;LOAD R0 WITH TEST NO.
24439  061010  013701  061046                  MOV     @#I0743,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
24440  061014  010605                          MOV     SP,R5           ;SAVE THE SP
24441  061016  032737  000004  066636          BIT     #4,@#OPTION     ;IS KJ11 INSTALLED ??
24442  061024  001435                          BEQ     00743           ;BR IF NOT - SKIP THIS TEST
24443  061026  013704  000004          R0743:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
24444  061032  012737  061072  000004          MOV     #A0743,@#4      ;"RED ZONE" TRAP GOES TO A0743
24445  061040  012706  177776                  MOV     #177776,SP      ;MAKE SP=177776
24446  061044  000257                          CCC                     ;SCOPE SYNC
24447
24448  061046  012746  177777          I0743:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO SR - SHOULD CAUSE
24449                                                                  ;"RED ZONE" TRAP TO BE SPRUNG
24450
24451  061052  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24452  061056  005004                          CLR     R4              ;[R4] = S / B SP
24453  061060  010603                          MOV     SP,R3           ;[R3] = WAS SP
24454  061062  010506                          MOV     R5,SP           ;RESET THE SP
24455  061064  104000          E10743: ERROR                           ;TRAP NOT SPRUNG
24456  061066  061026                  R0743                           ;ERROR LOOP RETURN ADDRESS
24457  061070  000413                  BR      00743                   ;GO TO SCOPE EXIT - SCHOOL'S OUT
24458
24459  061072  022706  000000          A0743:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
24460  061076  001407                  BEQ     B0743                   ;BR IF YES
24461
24462  061100  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
24463  061104  005004                          CLR     R4              ;[R4]= S / B SP
24464  061106  010603                          MOV     SP,R3           ;[R3] = WAS SP
24465  061110  010506                          MOV     R5,SP           ;RESET THE SP
24466  061112  104000          E20743: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
24467  061114  061026                  R0743                           ;ERROR LOOP RETURN
24468
24469  061116  010506          B0743:  MOV     R5,SP           ;FIX UP THE SP
24470
24471  061120  000004          00743:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24472  061122  013737  000010  067606          MOV     @#10,@#MBUF1    ;SAVE RSVD INSTR VECTOR
24473  061130  013737  000012  067610          MOV     @#12,@#MBUF1+2
24474
24475                                  ; ***************************************************************************
24476                                          .SBTTL T0744 RSVD INSTRUCTION TEST - 000007 THRU 000077
24477                                  ; ***************************************************************************
24478
24479                                  ;MICROPROGRAMMING  /  LOGIC INFORMATION
24480
24481                                  ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24482
24483                                  ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24484
24485                                  ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0744+2  /  [333]
24486
24487                                  ;CODES:         [140] SPS=7  /  N:C = 0000
24488
24489                                  ;SYNC:          B05J2 (-) T = 5.8 USEC
24490
24491                                  ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24492                                                  ;  K5-3 BUT04 H
24493
24494  061136  012700  000744          T0744:  MOV     #0744,R0                ;LOAD R0 WITH TEST NO.
24495  061142  010605                          MOV     SP,R5           ;SAVE THE SP
24496  061144  012737  061200  000010          MOV     #A0744,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24497  061152  005037  000012                  CLR     @#12
24498  061156  012701  000007                  MOV     #7,R1           ;SET UP FIRST ONE IN GROUP
24499  061162  010506                  R0744:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24500  061164  010137  061172                  MOV     R1,@#I0744      ;LOAD NEW INSTR
24501  061170  000257                          CCC                     ;SCOPE SYNC
24502
24503  061172  000007                  I0744:  000007                  ;TEST THE RSVD INSTR - THIS LOCATION
24504                                                                  ;GETS CHANGED EACH PASS THROUGH
24505
24506  061174  104005                  E0744:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24507  061176  061162                          R0744                   ;ERROR LOOP RETURN
24508
24509  061200  005201                  A0744:  INC     R1              ;GENERATE NEW RSVD INSTR
24510  061202  022701  000100                  CMP     #100,R1         ;AT END OF THIS GROUP ??
24511  061206  001365                          BNE     R0744           ;BR IF NOT
24512
24513  061210  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24514  061212  000004                  00744:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24515                                   ; ***************************************************************************
24516                                          .SBTTL T0745 RSVD INSTRUCTION TEST - 000210 THRU 000237
24517                                   ; ***************************************************************************
24518
24519                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24520
24521                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24522
24523                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24524
24525                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0745+2  /  [333]
24526
24527                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24528
24529                                   ;SYNC:          B05J2 (-) T = 5.8 USEC
24530
24531                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24532                                                   ;  K5-3 BUT04 H
24533                                                   ;K5-5 STPM3 H
24534
24535  061214  012700  000745        T0745:  MOV     #0745,R0                ;LOAD R0 WITH TEST NO.
24536  061220  010605                        MOV     SP,R5                   ;SAVE THE SP
24537  061222  032737  040000  066642        BIT     #40000,@#BPTLOC         ;BREAKPOINT HALT SET ??
24538  061230  001401                        BEQ     .+4                     ;BR IF NOT
24539  061232  000000                        HALT                            ;BREAK-DEPRESS CONTINUE TO RESTART
24540  061234  012737  061270  000010        MOV     #A0745,@#10             ;SET UP RSVD INSTR. TRAP VECTOR
24541  061242  005037  000012                CLR     @#12
24542  061246  012701  000210                MOV     #210,R1                 ;SET UP FIRST ONE IN GROUP
24543  061252  010506                R0745:  MOV     R5,SP                   ;RESET SP FOR ERROR LOOP AND NEW INSTR
24544  061254  010137  061262                MOV     R1,@#I0745              ;LOAD NEW INSTR
24545  061260  000257                        CCC                             ;SCOPE SYNC
24546
24547  061262  000210                I0745:  000210                          ;TEST THE RSVD INSTR - THIS LOCATION
24548                                                                         ;GETS CHANGED EACH PASS THROUGH
24549
24550  061264  104005                E0745:  ERROR5                          ;RSVD INSTR. IN R1 FAILED TO TRAP
24551  061266  061252                        R0745                           ;ERROR LOOP RETURN
24552
24553  061270  005201                A0745:  INC     R1                      ;GENERATE NEW RSVD INSTR
24554  061272  022701  000240                CMP     #240,R1                 ;AT END OF THIS GROUP ??
24555  061276  001365                        BNE     R0745                   ;BR IF NOT
24556
24557  061300  010506                        MOV     R5,SP                   ;MAKE SURE TO RESET THE SP
24558  061302  000004                0O745:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
24559
```

```
24560                                   ; ***************************************************************************
24561                                          .SBTTL T0746 RSVD INSTRUCTION TEST - 000065 THRU 000066
24562                                   ; ***************************************************************************
24563
24564                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24565
24566                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24567
24568                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24569
24570                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0746+2  /  [333]
24571
24572                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24573
24574                                   ;SYNC:          B05J2 (-) T = 5.8 USEC
24575
24576                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24577                                                   ;  K5-3 BUT04 H
24578                                                   ;K5-5 STPM3 H
24579
24580  061304  012700  000746          T0746:  MOV     #0746,R0                ;LOAD R0 WITH TEST NO.
24581  061310  105737  066636                  TSTB    @#OPTION        ;KT11D INSTALLED ??
24582  061314  100424                          BMI     00746           ;SKIP THIS TEST IF YES
24583  061316  010605                          MOV     SP,R5           ;SAVE THE SP
24584  061320  012737  061354  000010          MOV     #A0746,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24585  061326  005037  000012                  CLR     @#12
24586  061332  012701  000065                  MOV     #65,R1          ;SET UP FIRST ONE IN GROUP
24587  061336  010506                  R0746:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24588  061340  010137  061346                  MOV     R1,@#I0746      ;LOAD NEW INSTR
24589  061344  000257                          CCC                     ;SCOPE SYNC
24590
24591  061346  000065                  I0746:  000065                  ;TEST THE RSVD INSTR - THIS LOCATION
24592                                                                  ;GETS CHANGED EACH PASS THROUGH
24593
24594  061350  104005                  E0746:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24595  061352  061336                          R0746                   ;ERROR LOOP RETURN
24596
24597  061354  005201                  A0746:  INC     R1
24598  061356  022701  000067                  CMP     #67,R1          ;AT END OF THIS GROUP ??
24599  061362  001365                          BNE     R0746           ;BR IF NOT
24600
24601  061364  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24602  061366  000004                  00746:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24603
```

```
24604                                   ; ***************************************************************************
24605                                           .SBTTL T0747 RSVD INSTRUCTION TEST - 007000 THRU 007777
24606                                   ; ***************************************************************************
24607
24608                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24609
24610                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24611
24612                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24613
24614                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0747+2  /  [333]
24615
24616                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24617
24618                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24619
24620                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  / K5-3 BUT01 H  /  K5-3 BUT03 H
24621                                                   ;  K5-3 BUT04 H
24622                                                   ;K5-5 STPM3 H
24623
24624  061370  012700  000747        T0747:  MOV     #0747,R0                ;LOAD R0 WITH TEST NO.
24625  061374  032737  000001  066636        BIT     #1,@#OPTION     ;KE11-E (EIS) INSTALLED ??
24626  061402  001024                        BNE     00747           ;SKIP THIS TEST IF YES
24627  061404  010605                        MOV     SP,R5           ;SAVE THE SP
24628  061406  012737  061442  000010        MOV     #A0747,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24629  061414  005037  000012                CLR     @#12
24630  061420  012701  007000                MOV     #7000,R1        ;SET UP FIRST ONE IN GROUP
24631  061424  010506                R0747:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24632  061426  010137  061434                MOV     R1,@#I0747      ;LOAD NEW INSTR
24633  061432  000257                        CCC                     ;SCOPE SYNC
24634
24635  061434  007000                I0747:  007000                  ;TEST THE RSVD INSTR - THIS LOCATION
24636                                                                 ;GETS CHANGED EACH PASS THROUGH
24637
24638  061436  104005                E0747:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24639  061440  061424                        R0747                   ;ERROR LOOP RETURN
24640
24641  061442  005201                A0747:  INC     R1              ;GENERATE NEW RSVD INSTR
24642  061444  022701  010000                CMP     #10000,R1       ;AT END OF THIS GROUP ??
24643  061450  001365                        BNE     R0747           ;BR IF NOT
24644
24645  061452  010506                        MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24646  061454  000004                00747:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24647
```

```
24648                                   ; ***************************************************************************
24649                                          .SBTTL T0750 RSVD INSTRUCTION TEST - 070000 THRU 073777
24650                                   ; ***************************************************************************
24651
24652                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24653
24654                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24655
24656                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24657
24658                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0750+2  /  [333]
24659
24660                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24661
24662                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24663
24664                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24665                                                   ;  K5-3 BUT04 H
24666                                                   ;K5-5 STPM3 H
24667
24668  061456  012700  000750          T0750:  MOV     #0750,R0                ;LOAD R0 WITH TEST NO.
24669  061462  032737  000001  066636          BIT     #1,@#OPTION     ;IS THE KE11-E INSTALLED ??
24670  061470  001024                          BNE     00750           ;BR IF YES - SKIP THIS TEST
24671  061472  010605                          MOV     SP,R5           ;SAVE THE SP
24672  061474  012737  061530  000010          MOV     #A0750,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24673  061502  005037  000012                  CLR     @#12
24674  061506  012701  070000                  MOV     #70000,R1       ;SET UP FIRST ONE IN GROUP
24675  061512  010506                  R0750:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24676  061514  010137  061522                  MOV     R1,@#I0750      ;LOAD NEW INSTR
24677  061520  000257                          CCC                     ;SCOPE SYNC
24678
24679  061522  070000                  I0750:  070000                  ;TEST THE RSVD INSTR - THIS LOCATION
24680                                                                  ;GETS CHANGED EACH PASS THROUGH
24681
24682  061524  104005                  E0750:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24683  061526  061512                          R0750                   ;ERROR LOOP RETURN
24684
24685  061530  005201                  A0750:  INC     R1
24686  061532  022701  074000                  CMP     #74000,R1       ;AT END OF THIS GROUP ??
24687  061536  001365                          BNE     R0750           ;BR IF NOT
24688
24689  061540  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24690  061542  000004                  00750:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
24691                                   ; ***************************************************************************
24692                                          .SBTTL T0751 RSVD INSTRUCTION TEST - 075000 THRU 075037
24693                                   ; ***************************************************************************
24694
24695                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24696
24697                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24698
24699                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24700
24701                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0751+2  /  [333]
24702
24703                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24704
24705                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24706
24707                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24708                                                   ;  K5-3 BUT04 H
24709                                                   ;K5-5 STPM3 H
24710
24711  061544  012700  000751          T0751:  MOV     #0751,R0                ;LOAD R0 WITH TEST NO.
24712  061550  032737  000002  066636          BIT     #2,@#OPTION     ;KE11-F (FIS) INSTALLED ??
24713  061556  001024                          BNE     00751           ;SKIP TEST IF YES
24714  061560  010605                          MOV     SP,R5           ;SAVE THE SP
24715  061562  012737  061616  000010          MOV     #A0751,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24716  061570  005037  000012                  CLR     @#12
24717  061574  012701  075000                  MOV     #75000,R1       ;SET UP FIRST ONE IN GROUP
24718  061600  010506                  R0751:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24719  061602  010137  061610                  MOV     R1,@#I0751      ;LOAD NEW INSTR
24720  061606  000257                          CCC                     ;SCOPE SYNC
24721
24722  061610  075000                  I0751:  75000                   ;TEST THE RSVD INSTR - THIS LOCATION
24723                                                                   ;GETS CHANGED EACH PASS THROUGH
24724
24725  061612  104005                  E0751:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24726  061614  061600                          R0751                   ;ERROR LOOP RETURN
24727
24728  061616  005201                  A0751:  INC     R1              ;GENERATE NEW RSVD INSTR
24729  061620  022701  075040                  CMP     #75040,R1       ;AT END OF THIS GROUP ??
24730  061624  001365                          BNE     R0751           ;BR IF NOT
24731
24732  061626  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24733  061630  000004                  00751:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24734
```

```
24735                                   ; ***************************************************************************
24736                                          .SBTTL T0752 RSVD INSTRUCTION TEST - 075040 THRU 076777
24737                                   ; ***************************************************************************
24738
24739                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24740
24741                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24742
24743                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24744
24745                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0752+2  /  [333]
24746
24747                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24748
24749                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24750
24751                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24752                                                   ;  K5-3 BUT04 H
24753                                                   ;K5-5 STPM3 H
24754
24755  061632  012700  000752          T0752:  MOV     #0752,R0                ;LOAD R0 WITH TEST NO.
24756  061636  010605                          MOV     SP,R5           ;SAVE THE SP
24757  061640  012737  061674  000010          MOV     #A0752,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24758  061646  005037  000012                  CLR     @#12
24759  061652  012701  075040                  MOV     #75040,R1       ;SET UP FIRST ONE IN GROUP
24760  061656  010506                  R0752:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24761  061660  010137  061666                  MOV     R1,@#I0752      ;LOAD NEW INSTR
24762  061664  000257                          CCC                     ;SCOPE SYNC
24763
24764  061666  075040                  I0752:  75040                   ;TEST THE RSVD INSTR - THIS LOCATION
24765                                                                  ;GETS CHANGED EACH PASS THROUGH
24766
24767  061670  104005                  E0752:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24768  061672  061656                          R0752                   ;ERROR LOOP RETURN
24769
24770  061674  005201                  A0752:  INC     R1              ;GENERATE NEW RSVD INSTR
24771  061676  022701  077000                  CMP     #77000,R1       ;AT END OF THIS GROUP ??
24772  061702  001365                          BNE     R0752           ;BR IF NOT
24773
24774  061704  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24775  061706  000004                  00752:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24776
```

```
24777                                   ; ***************************************************************
24778                                           .SBTTL T0753 RSVD INSTRUCTION TEST - 106400 THRU 107777
24779                                   ; ***************************************************************
24780
24781                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24782
24783                                   ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6
24784
24785                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24786
24787                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0753+2  /  [333]
24788
24789                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24790
24791                                   ;SYNC:          BOSJ2 (-) T = 5.8 USEC
24792
24793                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24794                                                   ;  K5-3 BUT04 H
24795                                                   ;K5-5 STPM3 H
24796
24797  061710  012700  000753          T0753:  MOV     #0753,R0                ;LOAD R0 WITH TEST NO.
24798  061714  032737  000200  066636          BIT     #200,@#OPTION   ;IS THE KT11-D INSTALLED ??
24799  061722  001024                          BNE     00753           ;BR IF YES - SKIP THIS TEST
24800  061724  010605                          MOV     SP,R5           ;SAVE THE SP
24801  061726  012737  061762  000010          MOV     #A0753,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24802  061734  005037  000012                  CLR     @#12
24803  061740  012701  106400                  MOV     #106400,R1      ;SET UP FIRST ONE IN GROUP
24804  061744  010506                  R0753:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24805  061746  010137  061754                  MOV     R1,@#I0753      ;LOAD NEW INSTR
24806  061752  000257                          CCC                     ;SCOPE SYNC
24807
24808  061754  106400                  I0753:  106400                  ;TEST THE RSVD INSTR - THIS LOCATION
24809                                                                  ;GETS CHANGED EACH PASS THROUGH
24810
24811  061756  104005                  E0753:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24812  061760  061744                          R0753                   ;ERROR LOOP RETURN
24813
24814  061762  005201                  A0753:  INC     R1              ;GENERATE NEW RSVD INSTR
24815  061764  022701  110000                  CMP     #110000,R1      ;AT END OF THIS GROUP ??
24816  061770  001365                          BNE     R0753           ;BR IF NOT
24817
24818  061772  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24819  061774  000004                  00753:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24820
```

```
24821                                   ; ***************************************************************************
24822                                          .SBTTL T0754 RSVD INSTRUCTION TEST - 170000 THRU 177777
24823                                   ; ***************************************************************************
24824
24825                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24826
24827                                   ;ROM SEQ:       [100,126,007,1115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,
24828
24829                                   ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013
24830
24831                                   ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0754+2  /  [333]
24832
24833                                   ;CODES:         [140] SPS=7  /  N:C = 0000
24834
24835                                   ;SYNC:          B05J2 (-) T = 5.8 USEC
24836
24837                                   ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
24838                                                   ;  K5-3 BUT04 H
24839                                                   ;K5-5 STPM3 H
24840
24841  061776  012700  000754          T0754:  MOV     #0754,R0                ;LOAD R0 WITH TEST NO.
24842  062002  010605                          MOV     SP,R5           ;SAVE THE SP
24843  062004  012737  062040  000010          MOV     #A0754,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
24844  062012  005037  000012                  CLR     @#12
24845  062016  012701  170000                  MOV     #170000,R1      ;SET UP FIRST ONE IN GROUP
24846  062022  010506                  R0754:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
24847  062024  010137  062032                  MOV     R1,@#I0754      ;LOAD NEW INSTR
24848  062030  000257                          CCC                     ;SCOPE SYNC
24849
24850  062032  170000                  I0754:  170000                  ;TEST THE RSVD INSTR - THIS LOCATION
24851                                                                  ;GETS CHANGED EACH PASS THROUGH
24852
24853  062034  104005                  E0754:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
24854  062036  062022                          R0754                   ;ERROR LOOP RETURN
24855
24856  062040  005201                  A0754:  INC     R1              ;GENERATE NEW RSVD INSTR
24857  062042  022701  000000                  CMP     #0,R1           ;AT END OF THIS GROUP ??
24858  062046  001365                          BNE     R0754           ;BR IF NOT
24859
24860  062050  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
24861  062052  000004                  00754:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
24862  062054  013737  067606  000010          MOV     @#MBUF1,@#10    ;RESTORE RSVD INSTR VECTOR
24863  062062  013737  067610  000012          MOV     @#MBUF1+2,@#12
24864
```

```
24865
24866  062070  012737  065026  000014  TSET:   MOV     #TBSER,@#14     ;SET UP THE "T" BIT TRAP VECTOR
24867  062076  012737  000340  000016          MOV     #340,@#16       ;PRIORITY 7
24868  062104  012737  062104  066654  DMRET:  MOV     #DMRET,@#RETURN ;INITIALIZE SCOPE LOOP RETURN
24869
24870                                  ; ***************************************************************************
24871                                  .SBTTL T0755 BUT SERVICE TEST IN ROM LOCATION 373 - (TST %R)
24872                                  ; ***************************************************************************
24873
24874                                  ;THIS NEXT GROUP OF 28 SEQUENTIAL TESTS VERIFIES THAT A "T" BIT
24875                                  ;TRAP CAN BE SERVICED IN EACH MICROWORD THAT DOES A "BUT SERVICE"
24876                                  ;EACH ROUTINE ENTERS THE TRAP MICROUTINE WHEN THE TRAP IS SPRUNG
24877                                  ;WHICH GENERATES THE FOLLOWING ROM SEQUENCE:
24878
24879                                          ;[010,216,215,115,326,327,113,330,331,077,140,332,333,
24880                                          ;123,015,013]  FC 6,10,1
24881
24882                                  ;MICROPROGRAMMING  /  LOGIC INFORMATION
24883
24884                                  ;ROM SEQ:       [104,373,362,002,015,TRAP MICOROUTINE] FC 1,7,8,10,6
24885
24886                                  ;ACT BUTS:      37[004]100,104  /  27[373]000,002  /  26[002]010,010
24887
24888                                  ;EXEC:          [362] BUPP=002 ("T" BIT TRAP)
24889
24890                                  ;CODES:         N / A
24891
24892                                  ;SYNC:          B05J2  (-)
24893
24894                                  ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
24895                                  ;               K5-5 STPM2 H
24896
24897  062112  012700  000755  T0755:  MOV     #0755,R0                ;LOAD R0 WITH TEST NO.
24898  062116  013701  062142          MOV     @#I0755,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24899  062122  010605                  MOV     SP,R5           ;SAVE THE SP
24900  062124  010506          R0755:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
24901  062126  012746  000020          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
24902  062132  012746  062142          MOV     #I0755,-(SP)    ;MAKE NEW PC = I0755
24903  062136  000257                  CCC                     ;SCOPE SYNC
24904  062140  000006                  RTT                     ;SET "T" BIT - GO TO I0755
24905
24906  062142  005700          I0755:  TST     R0              ;TST INSTRUCTION SHOULD SPRING TRAP
24907
24908  062144  104005          E0755:  ERROR5                  ;BUT SERVICE IN 373 FAILED
24909  062146  062124                  R0755                   ;ERROR LOOP RETURN
24910
24911  062150  000004          00755:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24912
```

```
24913                                   ; ***************************************************************************
24914                                   .SBTTL T0756 BUT SERVICE TEST IN ROM LOCATION 366 - (BISB RA,(RB))
24915                                   ; ***************************************************************************
24916
24917                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24918
24919                                   ;ROM SEQ:       [161,266,267,270,230,254,074,366,375,017,015,
24920                                   ;               TRAP MICROROUTINE] FC 1,3,8,10,6
24921                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,237  /  34[237]220,230
24922                                   ;               16[366]016,017  /  26[017]010,010
24923                                   ;EXEC:          [375] BUPP=017 ("T" BIT TRAP)
24924
24925                                   ;CODES:         N / A
24926
24927                                   ;SYNC:          BOSJ2  (-)
24928
24929                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
24930                                   ;               K5-5 STPM2 H
24931
24932  062152  012700  000756          T0756:  MOV     #0756,R0                ;LOAD R0 WITH TEST NO.
24933  062156  013701  062206                  MOV     @#I0756,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24934  062162  010605                          MOV     SP,R5           ;SAVE THE SP
24935  062164  010506                  R0756:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
24936  062166  012702  067603                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0
24937  062172  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
24938  062176  012746  062206                  MOV     #I0756,-(SP)    ;MAKE NEW PC = I0756
24939  062202  000257                          CCC                     ;SCOPE SYNC
24940  062204  000006                          RTT                     ;SET "T" BIT - GO TO I0756
24941
24942  062206  150012                  I0756:  BISB    R0,(R2)         ;BISB INSTRUCTION SHOULD SPRING TRAP
24943
24944  062210  104005                  E0756:  ERROR5                  ;BUT SERVICE IN 366 FAILED
24945  062212  062164                          R0756                   ;ERROR LOOP RETURN
24946
24947  062214  000004                  00756:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24948
```

```
24949                                   ; ***************************************************************************
24950                                   .SBTTL T0757 BUT SERVICE TEST IN ROM LOCATION 367 - (SXT (RN))
24951                                   ; ***************************************************************************
24952
24953                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24954
24955                                   ;ROM SEQ:       [161,266,267,234,367,375,017,015,TRAP MICROROUTINE]
24956                                   ;               FC 1,3,8,10,6
24957                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,234  /  16[367]016,017
24958                                   ;               26[017]010,010
24959
24960                                   ;EXEC:          [375] BUPP=017 ("T" BIT TRAP)
24961
24962                                   ;CODES:         N / A
24963
24964                                   ;SYNC:          B05J2  (-)
24965
24966                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
24967                                   ;               K5-5 STPM2 H
24968
24969  062216  012700  000757          T0757:  MOV     #0757,R0                ;LOAD R0 WITH TEST NO.
24970  062222  013701  062252                  MOV     @#I0757,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
24971  062226  010605                          MOV     SP,R5           ;SAVE THE SP
24972  062230  010506          R0757:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
24973  062232  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
24974  062236  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
24975  062242  012746  062252                  MOV     #I0757,-(SP)    ;MAKE NEW PC = I0757
24976  062246  000257                          CCC                     ;SCOPE SYNC
24977  062250  000006                          RTT                     ;SET "T" BIT - GO TO I0757
24978
24979  062252  006712          I0757:  SXT     (R2)            ;SXT INSTRUCTION SHOULD SPRING TRAP
24980
24981  062254  104005          E0757:  ERROR5                  ;BUT SERVICE IN 367 FAILED
24982  062256  062230                  R0757                   ;ERROR LOOP RETURN
24983
24984  062260  000004          00757:  SCOPE                   ;CALL SCOPE LOOP UTILITY
24985
```

```
24986                                   ; ***************************************************************************
24987                                   .SBTTL T0760 BUT SERVICE TEST IN ROM LOCATION 132 - (SXT %R)
24988                                   ; ***************************************************************************
24989
24990                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
24991
24992                                   ;ROM SEQ:       [132,360,002,015,TRAP MICROROUTINE] FC 1,8,10,6
24993
24994                                   ;ACT BUTS:      37[004]100,132  /  27[132]000,002  /  26[002]010,010
24995
24996                                   ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)
24997
24998                                   ;CODES:         N / A
24999
25000                                   ;SYNC:          B05J2  (-)
25001
25002                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25003                                   ;               K5-5 STPM2 H
25004
25005  062262  012700  000760          T0760:  MOV     #0760,R0                ;LOAD R0 WITH TEST NO.
25006  062266  013701  062312                  MOV     @#I0760,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25007  062272  010605                          MOV     SP,R5           ;SAVE THE SP
25008  062274  010506                  R0760:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25009  062276  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25010  062302  012746  062312                  MOV     #I0760,-(SP)    ;MAKE NEW PC = I0760
25011  062306  000257                          CCC                     ;SCOPE SYNC
25012  062310  000006                          RTT                     ;SET "T" BIT - GO TO I0760
25013
25014  062312  006702                  I0760:  SXT     R2              ;SXT INSTRUCTION SHOULD SPRING TRAP
25015
25016  062314  104005                  E0760:  ERROR5                  ;BUT SERVICE IN 132 FAILED
25017  062316  062274                          R0760                   ;ERROR LOOP RETURN
25018
25019  062320  000004                  00760:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25020
```

```
25021                                   ; ***************************************************************************
25022                                   .SBTTL T0761 BUT SERVICE TEST IN ROM LOCATION 372 - (NEG %R)
25023                                   ; ***************************************************************************
25024
25025                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25026
25027                                   ;ROM SEQ:       [105,372,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6
25028
25029                                   ;ACT BUTS:      37[004]100,105  /  31[105]360,360  /  27[372]000,002
25030                                   ;               26[002]010,010
25031
25032                                   ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)
25033
25034                                   ;CODES:         N / A
25035
25036                                   ;SYNC:          B05J2  (-)
25037
25038                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25039                                   ;               K5-5 STPM2 H
25040
25041  062322  012700  000761          T0761:  MOV     #0761,R0                ;LOAD R0 WITH TEST NO.
25042  062326  013701  062352                  MOV     @#I0761,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25043  062332  010605                          MOV     SP,R5           ;SAVE THE SP
25044  062334  010506                  R0761:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25045  062336  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25046  062342  012746  062352                  MOV     #I0761,-(SP)    ;MAKE NEW PC = I0761
25047  062346  000257                          CCC                     ;SCOPE SYNC
25048  062350  000006                          RTT                     ;SET "T" BIT - GO TO I0761
25049
25050  062352  005402                  I0761:  NEG     R2              ;NEG INSTRUCTION SHOULD SPRING TRAP
25051
25052  062354  104005                  E0761:  ERROR5                  ;BUT SERVICE IN 372 FAILED
25053  062356  062334                          R0761                   ;ERROR LOOP RETURN
25054
25055  062360  000004                  00761:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25056
```

```
25057                                   ; ***************************************************************************
25058                                   .SBTTL T0762 BUT SERVICE TEST IN ROM LOCATION 370 - (SUB (RA),RB)
25059                                   ; ***************************************************************************
25060
25061                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25062
25063                                   ;ROM SEQ:       [141,247,250,121,370,360,002,015,TRAP MICROROUTINE]
25064                                   ;               FC 1,2,8,10,6
25065
25066                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,121  /  27[370]000,002
25067                                   ;               26[002]010,010
25068
25069                                   ;EXQC:  [360] BUPP=002 ("T" BIT TRAP)
25070
25071                                   ;CODES:         N / A
25072
25073                                   ;SYNC:          BOSJ2  (-)
25074
25075                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25076                                   ;               K5-5 STPM2 H
25077
25078  062362  012700  000762          T0762:  MOV     #0762,R0                ;LOAD R0 WITH TEST NO.
25079  062366  013701  062416                  MOV     @#I0762,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25080  062372  010605                          MOV     SP,R5           ;SAVE THE SP
25081  062374  010506                  R0762:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25082  062376  012703  067602                  MOV     #MBUF0,R3       ;SOURCE ADDR = MBUF0
25083  062402  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25084  062406  012746  062416                  MOV     #I0762,-(SP)    ;MAKE NEW PC = I0762
25085  062412  000257                          CCC                     ;SCOPE SYNC
25086  062414  000006                          RTT                     ;SET "T" BIT - GO TO I0762
25087
25088  062416  161302                  I0762:  SUB     (R3),R2         ;SUB INSTRUCTION SHOULD SPRING TRAP
25089
25090  062420  104005                  E0762:  ERROR5                  ;BUT SERVICE IN 370 FAILED
25091  062422  062374                          R0762                   ;ERROR LOOP RETURN
25092
25093  062424  000004                  00762:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25094
```

```
25095                                   ; ***************************************************************************
25096                                   .SBTTL T0763 BUT SERVICE TEST IN ROM LOCATION 371 - (ADD (RA),RB)
25097                                   ; ***************************************************************************
25098
25099                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25100
25101                                   ;ROM SEQ:       [141,247,250,120,371,360,002,015,TRAP MICROROUTINE]
25102                                   ;               FC 1,2,8,10,6
25103
25104                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,120  /  31[120]360,360
25105                                   ;               27[371]000,002  /  26[002]010,010
25106
25107                                   ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)
25108
25109                                   ;CODES:         N / A
25110
25111                                   ;SYNC:          B05J2  (-)
25112
25113                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25114                                   ;               K5-5 STPM2 H
25115
25116  062426  012700  000763          T0763:  MOV     #0763,R0                ;LOAD R0 WITH TEST NO.
25117  062432  013701  062462                  MOV     @#I0763,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25118  062436  010605                          MOV     SP,R5           ;SAVE THE SP
25119  062440  010506                  R0763:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25120  062442  012705  067602                  MOV     #MBUF0,R5       ;SOURCE ADDR = MBUF0
25121  062446  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25122  062452  012746  062462                  MOV     #I0763,-(SP)    ;MAKE NEW PC = I0763
25123  062456  000257                          CCC                     ;SCOPE SYNC
25124  062460  000006                          RTT                     ;SET "T" BIT - GO TO I0763
25125
25126  062462  061502                  I0763:  ADD     (R5),R2         ;ADD INSTRUCTION SHOULD SPRING TRAP
25127
25128  062464  104005                  E0763:  ERROR5                  ;BUT SERVICE IN 371 FAILED
25129  062466  062440                          R0763                   ;ERROR LOOP RETURN
25130
25131  062470  000004                  00763:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25132
```

```
25133                                   ; ***************************************************************************
25134                                   .SBTTL T0764 BUT SERVICE TEST IN ROM LOCATION 135 - (SWAB %R)
25135                                   ; ***************************************************************************
25136
25137                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25138
25139                                   ;ROM SEQ:       [134,135,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6
25140
25141                                   ;ACT BUTS:      37[004]100,134  /  27[135]000,002  /  26[002]010,010
25142
25143                                   ;EXEC:          [135] BUPP=002 ("T" BIT TRAP)
25144
25145                                   ;CODES:         N / A
25146
25147                                   ;SYNC:          B05J2  (-)
25148
25149                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25150                                   ;               K5-5 STPM2 H
25151
25152  062472  012700  000764   T0764:  MOV     #0764,R0                ;LOAD R0 WITH TEST NO.
25153  062476  013701  062522           MOV     @#I0764,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25154  062502  010605                   MOV     SP,R5           ;SAVE THE SP
25155  062504  010506           R0764:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25156  062506  012746  000020           MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25157  062512  012746  062522           MOV     #I0764,-(SP)    ;MAKE NEW PC = I0764
25158  062516  000257                   CCC                     ;SCOPE SYNC
25159  062520  000006                   RTT                     ;SET "T" BIT - GO TO I0764
25160
25161  062522  000302           I0764:  SWAB    R2              ;SWAB INSTRUCTION SHOULD SPRING TRAP
25162
25163  062524  104005           E0764:  ERROR5                  ;BUT SERVICE IN 135 FAILED
25164  062526  062504                   R0764                   ;ERROR LOOP RETURN
25165
25166  062530  000004           00764:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25167
```

```
25168                                   ; ***************************************************************************
25169                                   .SBTTL T0765 BUT SERVICE TEST IN ROM LOCATION 363 - (SUB RA,RB)
25170                                   ; ***************************************************************************
25171
25172                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25173
25174                                   ;ROM SEQ:       [103,363,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6
25175
25176                                   ;ACT BUTS:      37[004]100,103  /  27[363]000,002  /  26[002]010,010
25177
25178                                   ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)
25179
25180                                   ;CODES:         N / A
25181
25182                                   ;SYNC:          B05J2  (-)
25183
25184                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25185                                   ;               K5-5 STPM2 H
25186
25187  062532  012700  000765          T0765:  MOV     #0765,R0                ;LOAD R0 WITH TEST NO.
25188  062536  013701  062562                  MOV     @#I0765,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25189  062542  010605                          MOV     SP,R5           ;SAVE THE SP
25190  062544  010506                  R0765:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25191  062546  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25192  062552  012746  062562                  MOV     #I0765,-(SP)    ;MAKE NEW PC = I0765
25193  062556  000257                          CCC                     ;SCOPE SYNC
25194  062560  000006                          RTT                     ;SET "T" BIT - GO TO I0765
25195
25196  062562  160304          I0765:  SUB     R3,R4           ;SUB INSTRUCTION SHOULD SPRING TRAP
25197
25198  062564  104005          E0765:  ERROR5                  ;BUT SERVICE IN 363 FAILED
25199  062566  062544                  R0765                   ;ERROR LOOP RETURN
25200
25201  062570  000004          00765:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25202
```

```
25203                                   ; ************************************************************************
25204                                   .SBTTL T0766 BUT SERVICE TEST IN ROM LOCATION 364 - (ADD RA,RB)
25205                                   ; ************************************************************************
25206
25207                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25208
25209                                   ;ROM SEQ:       [102,364,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6
25210
25211                                   ;ACT BUTS:      37[004]100,102  /  31[102]360,360  /  27[364]000,002
25212                                   ;               26[002]010,010
25213
25214                                   ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)
25215
25216                                   ;CODES:         N / A
25217
25218                                   ;SYNC:          B05J2  (-)
25219
25220                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25221                                   ;               K5-5 STPM2 H
25222
25223  062572  012700  000766  T0766:  MOV     #0766,R0            ;LOAD R0 WITH TEST NO.
25224  062576  013701  062622          MOV     @#I0766,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25225  062602  010605                  MOV     SP,R5           ;SAVE THE SP
25226  062604  010506          R0766:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25227  062606  012746  000020          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25228  062612  012746  062622          MOV     #I0766,-(SP)    ;MAKE NEW PC = I0766
25229  062616  000257                  CCC                     ;SCOPE SYNC
25230  062620  000006                  RTT                     ;SET "T" BIT - GO TO I0766
25231
25232  062622  060304          I0766:  ADD     R3,R4           ;ADD INSTRUCTION SHOULD SPRING TRAP
25233
25234  062624  104005          E0766:  ERROR5                  ;BUT SERVICE IN 364 FAILED
25235  062626  062604                  R0766                   ;ERROR LOOP RETURN
25236
25237  062630  000004          00766:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25238
```

```
25239                                   ; ***************************************************************************
25240                                   .SBTTL T0767 BUT SERVICE TEST IN ROM LOCATION 125 - (MOV RA,(RB))
25241                                   ; ***************************************************************************
25242
25243                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25244
25245                                   ;ROM SEQ:       [171,257,201,125,375,017,015,TRAP MICROROUTINE] FC 1,4,8,10,6
25246
25247                                   ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,017
25248                                   ;               26[017]010,010
25249
25250                                   ;EXEC:          [375] BUPP=017 ("T" BIT TRAP)
25251
25252                                   ;CODES:         N / A
25253
25254                                   ;SYNC:          BOSJ2  (-)
25255
25256                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25257                                   ;               K5-5 STPM2 H
25258
25259  062632  012700  000767          T0767:  MOV     #0767,R0                ;LOAD R0 WITH TEST NO.
25260  062636  013701  062666                  MOV     @#I0767,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25261  062642  010605                          MOV     SP,R5           ;SAVE THE SP
25262  062644  012702  067602                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
25263  062650  010506                  R0767:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25264  062652  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25265  062656  012746  062666                  MOV     #I0767,-(SP)    ;MAKE NEW PC = I0767
25266  062662  000257                          CCC                     ;SCOPE SYNC
25267  062664  000006                          RTT                     ;SET "T" BIT - GO TO I0767
25268
25269  062666  010012                  I0767:  MOV     R0,(R2)         ;MOV INSTRUCTION SHOULD SPRING TRAP
25270
25271  062670  104005                  E0767:  ERROR5                  ;BUT SERVICE IN 125 FAILED
25272  062672  062650                          R0767                   ;ERROR LOOP RETURN
25273
25274  062674  000004                  00767:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25275
```

E01


```
25276                                   ; ***************************************************************************
25277                                   .SBTTL T0770 BUT SERVICE TEST IN ROM LOCATION 170 - (MOV RA,RB)
25278                                   ; ***************************************************************************
25279
25280                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25281
25282                                   ;ROM SEQ:       [170,204,002,015,TRAP MICROROUTINE] FC 1,4,10,6
25283
25284                                   ;ACT BUTS:      37[004]100,170  /  20[170]000,002  /  26[002]010,010
25285
25286                                   ;EXEC:          [204] BUPP=002 ("T" BIT TRAP)
25287
25288                                   ;CODES:         N / A
25289
25290                                   ;SYNC:          B05J2  (-)
25291
25292                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25293                                   ;               K5-5 STPM2 H
25294
25295  062676  012700  000770          T0770:  MOV     #0770,R0                ;LOAD R0 WITH TEST NO.
25296  062702  013701  062726                  MOV     @#I0770,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25297  062706  010605                          MOV     SP,R5           ;SAVE THE SP
25298  062710  010506                  R0770:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25299  062712  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25300  062716  012746  062726                  MOV     #I0770,-(SP)    ;MAKE NEW PC = I0770
25301  062722  000257                          CCC                     ;SCOPE SYNC
25302  062724  000006                          RTT                     ;SET "T" BIT - GO TO I0770
25303
25304  062726  010003          I0770:  MOV     R0,R3           ;MOV INSTRUCTION SHOULD SPRING TRAP
25305
25306  062730  104005          E0770:  ERROR5                  ;BUT SERVICE IN 170 FAILED
25307  062732  062710                  R0770                   ;ERROR LOOP RETURN
25308
25309  062734  000004          00770:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25310
```

```
25311                                   ; ************************************************************************
25312                                   .SBTTL T0771 BUT SERVICE TEST IN ROM LOCATION 160 - (MOV (RA),RB)
25313                                   ; ************************************************************************
25314
25315                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25316
25317                                   ;ROM SEQ:       [141,247,250,160,204,002,015,TRAP MICROROUTINE]
25318                                   ;               FC 1,2,4,10,6
25319
25320                                   ;ACT BUTS:      37[004]100,141  /  35[247]120,160  /  20[160]000,002
25321                                   ;               26[002]010,010
25322
25323                                   ;EXEC:          [204] BUPP=002 ("T" BIT TRAP)
25324
25325                                   ;CODES:         N / A
25326
25327                                   ;SYNC:          B05J2  (-)
25328
25329                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25330                                   ;               K5-5 STPM2 H
25331
25332  062736  012700  000771          T0771:  MOV     #0771,R0                ;LOAD R0 WITH TEST NO.
25333  062742  013701  062772                  MOV     @#I0771,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25334  062746  010605                          MOV     SP,R5           ;SAVE THE SP
25335  062750  012703  067612                  MOV     #DWTA,R3        ;SOURCE ADDR = DWTA
25336  062754  010506                  R0771:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25337  062756  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25338  062762  012746  062772                  MOV     #I0771,-(SP)    ;MAKE NEW PC = I0771
25339  062766  000257                          CCC                     ;SCOPE SYNC
25340  062770  000006                          RTT                     ;SET "T" BIT - GO TO I0771
25341
25342  062772  011304                  I0771:  MOV     (R3),R4         ;MOV INSTRUCTION SHOULD SPRING TRAP
25343
25344  062774  104005                  E0771:  ERROR5                  ;BUT SERVICE IN 160 FAILED
25345  062776  062754                          R0771                   ;ERROR LOOP RETURN
25346
25347  063000  000004                  00771:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25348
```

```
25349                                   ; ***************************************************************************
25350                                   .SBTTL T0772 BUT SERVICE TEST IN ROM LOCATION 003 - (MOVB RA,RB)
25351                                   ; ***************************************************************************
25352
25353                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25354
25355                                   ;ROM SEQ:       [170,204,003,204,002,015,TRAP MICROROUTINE] FC 1,4,10,6
25356
25357                                   ;ACT BUTS:      37[004]100,170  /  20[170]000,003  /  27[003]000,002
25358                                   ;               26[002]010,010
25359
25360                                   ;EXEC:          [204] 2ND TIME THRU BUPP=002  ("T" BIT TRAP)
25361
25362                                   ;CODES:         N / A
25363
25364                                   ;SYNC:          B05J2  (-)
25365
25366                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25367                                   ;               K5-5 STPM2 H
25368
25369  063002  012700  000772          T0772:  MOV     #0772,R0                ;LOAD R0 WITH TEST NO.
25370  063006  013701  063032                  MOV     @#I0772,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25371  063012  010605                          MOV     SP,R5           ;SAVE THE SP
25372  063014  010506          R0772:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25373  063016  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25374  063022  012746  063032                  MOV     #I0772,-(SP)    ;MAKE NEW PC = I0772
25375  063026  000257                          CCC                     ;SCOPE SYNC
25376  063030  000006                          RTT                     ;SET "T" BIT - GO TO I0772
25377
25378  063032  110003          I0772:  MOVB    R0,R3           ;MOVB INSTRUCTION SHOULD SPRING TRAP
25379
25380  063034  104005          E0772:  ERROR5                  ;BUT SERVICE IN 003 FAILED
25381  063036  063014                  R0772                   ;ERROR LOOP RETURN
25382
25383  063040  000004          00772:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25384
```

```
25385                                   ; ************************************************************************
25386                                   .SBTTL T0773 BUT SERVICE TEST IN ROM LOCATION 271 - (ROR %R)
25387                                   ; ************************************************************************
25388
25389                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25390
25391                                   ;ROM SEQ:       [106,271,274,002,015,TRAP MICROROUTINE] FC 1,9,10,6
25392
25393                                   ;ACT BUTS:      37[004]100,106  /  27[271]000,002  /  26[002]010,010
25394
25395                                   ;EXEC:          [274] BUPP=002 ("T" BIT TRAP)
25396
25397                                   ;CODES:         N / A
25398
25399                                   ;SYNC:          B05J2  (-)
25400
25401                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25402                                   ;               K5-5 STPM2 H
25403
25404  063042  012700  000773          T0773:  MOV     #0773,R0                ;LOAD R0 WITH TEST NO.
25405  063046  013701  063072                  MOV     @#I0773,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25406  063052  010605                          MOV     SP,R5           ;SAVE THE SP
25407  063054  010506                  R0773:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25408  063056  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25409  063062  012746  063072                  MOV     #I0773,-(SP)    ;MAKE NEW PC = I0773
25410  063066  000257                          CCC                     ;SCOPE SYNC
25411  063070  000006                          RTT                     ;SET "T" BIT - GO TO I0773
25412
25413  063072  006003          I0773:  ROR     R3              ;ROR INSTRUCTION SHOULD SPRING TRAP
25414
25415  063074  104005          E0773:  ERROR5                  ;BUT SERVICE IN 271 FAILED
25416  063076  063054                  R0773                   ;ERROR LOOP RETURN
25417
25418  063100  000004          00773:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25419
```

```
.MAIN.  MACY11 27(732)  15-OCT-76  14:58  PAGE 630
DBQEAB.CMB      T0773 BUT SERVICE TEST IN ROM LOCATION 271 - (ROR %R)

25420                           ; ***************************************************************************
25421                           .SBTTL T0774 BUT SERVICE TEST IN ROM LOCATION 273 - (RORB %R)
25422                           ; ***************************************************************************
25423
25424                           ;MICROPROGRAMMING  /  LOGIC INFORMATION
25425
25426                           ;ROM SEQ:       [107,272,273,274,002,015,TRAP MICROROUTINE] FC 1,9,10,6
25427
25428                           ;ACT BUTS:      [274] BUPP=002 ("T" BIT TRAP)
25429
25430                           ;EXEC:          Z
25431
25432                           ;CODES:         N / A
25433
25434                           ;SYNC:          B05J2  (-)
25435
25436                           ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25437                           ;               K5-5 STPM2 H
25438
25439  063102  012700  000774   T0774:  MOV     #0774,R0                ;LOAD R0 WITH TEST NO.
25440  063106  013701  063132           MOV     @#I0774,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25441  063112  010605                   MOV     SP,R5           ;SAVE THE SP
25442  063114  010506           R0774:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25443  063116  012746  000020           MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25444  063122  012746  063132           MOV     #I0774,-(SP)    ;MAKE NEW PC = I0774
25445  063126  000257                   CCC                     ;SCOPE SYNC
25446  063130  000006                   RTT                     ;SET "T" BIT - GO TO I0774
25447
25448  063132  106003           I0774:  RORB    R3              ;RORB INSTRUCTION SHOULD SPRING TRAP
25449
25450  063134  104005           E0774:  ERROR5                  ;BUT SERVICE IN 273 FAILED
25451  063136  063114                   R0774                   ;ERROR LOOP RETURN
25452
25453  063140  000004           00774:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25454
```

```
25455                                   ; ********************************************************************************
25456                                   .SBTTL T0775 BUT SERVICE TEST IN ROM LOCATION 277 - (ROR (RN))
25457                                   ; ********************************************************************************
25458
25459                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25460
25461                                   ;ROM SEQ:       [161,266,267,232,275,277,376,017,015,TRAP MICROROUTINE]
25462                                   ;               FC 1,3,9,10,6
25463
25464                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,017
25465                                   ;               26[017]010,010
25466
25467                                   ;EXEC:          [376] BUPP = 017 ("T" BIT TRAP)
25468
25469                                   ;CODES:         N / A
25470
25471                                   ;SYNC:          B05J2  (-)
25472
25473                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25474                                   ;               K5-5 STPM2 H
25475
25476  063142  012700  000775          T0775:  MOV     #0775,R0                ;LOAD R0 WITH TEST NO.
25477  063146  013701  063176                  MOV     @#I0775,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25478  063152  010605                          MOV     SP,R5           ;SAVE THE SP
25479  063154  012703  067602                  MOV     #MBUF0,R3       ;DEST ADDR = MBUF0
25480  063160  010506                  R0775:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25481  063162  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25482  063166  012746  063176                  MOV     #I0775,-(SP)    ;MAKE NEW PC = I0775
25483  063172  000257                          CCC                     ;SCOPE SYNC
25484  063174  000006                          RTT                     ;SET "T" BIT - GO TO I0775
25485
25486  063176  006013                  I0775:  ROR     (R3)            ;ROR INSTRUCTION SHOULD SPRING TRAP
25487
25488  063200  104005                  E0775:  ERROR5                  ;BUT SERVICE IN 277 FAILED
25489  063202  063160                          R0775                   ;ERROR LOOP RETURN
25490
25491  063204  000004                  00775:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25492
```

```
25493                                   ; ************************************************************************
25494                                   .SBTTL T0776 BUT SERVICE TEST IN ROM LOCATION 374 - (NEGB (RN))
25495                                   ; ************************************************************************
25496
25497                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25498
25499                                   ;ROM SEQ:       [161,266,267,223,253,075,374,375,017,015,TRAP MICROROUTINE]
25500                                   ;               FC 1,3,9,8,10,6
25501
25502                                   ;ACT BUTS:      37[004]100,161  /  33[266]220,223  /  16[374]016,017
25503                                   ;               26[017]010,010
25504
25505                                   ;EXEC:          [375] BUPP=017 ("T" BIT TRAP)
25506
25507                                   ;CODES:         N / A
25508
25509                                   ;SYNC:          B05J2  (-)
25510
25511                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25512                                   ;               K5-5 STPM2 H
25513
25514  063206  012700  000776          T0776:  MOV     #0776,R0                ;LOAD R0 WITH TEST NO.
25515  063212  013701  063242                  MOV     @#I0776,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25516  063216  010605                          MOV     SP,R5           ;SAVE THE SP
25517  063220  012703  067603                  MOV     #MBUF0+1,R3     ;DEST ADDR = MBUF0+1 (ODD)
25518  063224  010506                  R0776:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25519  063226  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25520  063232  012746  063242                  MOV     #I0776,-(SP)    ;MAKE NEW PC = I0776
25521  063236  000257                          CCC                     ;SCOPE SYNC
25522  063240  000006                          RTT                     ;SET "T" BIT - GO TO I0776
25523
25524  063242  105413                  I0776:  NEGB    (R3)            ;NEGB INSTRUCTION SHOULD SPRING TRAP
25525
25526  063244  104005                  E0776:  ERROR5                  ;BUT SERVICE IN 374 FAILED
25527  063246  063224                          R0776                   ;ERROR LOOP RETURN
25528
25529  063250  000004                  00776:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25530
```

```
25531                                   ; ***************************************************************************
25532                                   .SBTTL T0777 BUT SERVICE TEST IN ROM LOCATION 306 - (JMP (RN))
25533                                   ; ***************************************************************************
25534
25535                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25536
25537                                   ;ROM SEQ:       [151,300,306,313,017,015,TRAP MICROROUTINE] FC 1,5,10,6
25538
25539                                   ;ACT BUTS:      37[004]100,151  /  15[151]306,306  /  16[306]016,017
25540                                   ;               26[017]010,010
25541
25542                                   ;EXEC:          [313] BUPP=017 ("T" BIT TRAP)
25543
25544                                   ;CODES:         N / A
25545
25546                                   ;SYNC:          B05J2  (-)
25547
25548                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25549                                   ;               K5-5 STPM2 H
25550
25551  063252  012700  000777          T0777:  MOV     #0777,R0                ;LOAD R0 WITH TEST NO.
25552  063256  013701  063306                  MOV     @#I0777,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25553  063262  010605                          MOV     SP,R5           ;SAVE THE SP
25554  063264  012702  063310                  MOV     #E0777,R2       ;DEST ADDR = E0777 FOR JMP
25555  063270  010506                  R0777:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25556  063272  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25557  063276  012746  063306                  MOV     #I0777,-(SP)    ;MAKE NEW PC = I0777
25558  063302  000257                          CCC                     ;SCOPE SYNC
25559  063304  000006                          RTT                     ;SET "T" BIT - GO TO I0777
25560
25561  063306  000112                  I0777:  JMP     (R2)            ;JMP INSTRUCTION SHOULD SPRING TRAP
25562
25563  063310  104005                  E0777:  ERROR5                  ;BUT SERVICE IN 306 FAILED
25564  063312  063270                          R0777                   ;ERROR LOOP RETURN
25565
25566  063314  000004                  00777:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25567
```

```
25568                                   ; ***************************************************************************
25569                                   .SBTTL T1000 BUT SERVICE TEST IN ROM LOCATION 110 - (BVS A)
25570                                   ; ***************************************************************************
25571
25572                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25573
25574                                   ;ROM SEQ:       [110,347,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25575
25576                                   ;ACT BUTS:      37[004]100,110  /  16[110]016,017  /  26[017]010,010
25577
25578                                   ;EXEC:          [347] BUPP=017 ("T" BIT TRAP)
25579
25580                                   ;CODES:         N / A
25581
25582                                   ;SYNC:          B05J2  (-)
25583
25584                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25585                                   ;               K5-5 STPM2 H
25586
25587  063316  012700  001000          T1000:  MOV     #1000,R0                ;LOAD R0 WITH TEST NO.
25588  063322  013701  063346                  MOV     @#I1000,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25589  063326  010605                          MOV     SP,R5           ;SAVE THE SP
25590  063330  010506                  R1000:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25591  063332  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25592  063336  012746  063346                  MOV     #I1000,-(SP)    ;MAKE NEW PC = I1000
25593  063342  000257                          CCC                     ;SCOPE SYNC
25594  063344  000006                          RTT                     ;SET "T" BIT - GO TO I1000
25595
25596  063346  102400                  I1000:  BVS     E1000           ;BVS INSTRUCTION SHOULD SPRING TRAP
25597
25598  063350  104005                  E1000:  ERROR5                  ;BUT SERVICE IN 110 FAILED
25599  063352  063330                          R1000                   ;ERROR LOOP RETURN
25600
25601  063354  000004                  01000:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25602
```

```
25603                                   ; ***************************************************************************
25604                                   .SBTTL T1001 BUT SERVICE TEST IN ROM LOCATION 340 - (BR A)
25605                                   ; ***************************************************************************
25606
25607                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25608
25609                                   ;ROM SEQ:       [111,340,341,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25610
25611                                   ;ACT BUTS:      37[004]100,111  /  16[340]016,017  /  26[017]010,010
25612
25613                                   ;EXEC:          [341] BUPP=017 ("T" BIT TRAP)
25614
25615                                   ;CODES:         N / A
25616
25617                                   ;SYNC:          B05J2  (-)
25618
25619                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25620                                   ;               K5-5 STPM2 H
25621
25622  063356  012700  001001          T1001:  MOV     #1001,R0                ;LOAD R0 WITH TEST NO.
25623  063362  013701  063406                  MOV     @#I1001,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25624  063366  010605                          MOV     SP,R5           ;SAVE THE SP
25625  063370  010506                  R1001:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25626  063372  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25627  063376  012746  063406                  MOV     #I1001,-(SP)    ;MAKE NEW PC = I1001
25628  063402  000257                          CCC                     ;SCOPE SYNC
25629  063404  000006                          RTT                     ;SET "T" BIT - GO TO I1001
25630
25631  063406  000400                  I1001:  BR      E1001           ;BR INSTRUCTION SHOULD SPRING TRAP
25632
25633  063410  104005                  E1001:  ERROR5                  ;BUT SERVICE IN 340 FAILED
25634  063412  063370                          R1001                   ;ERROR LOOP RETURN
25635
25636  063414  000004                  01001:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25637
```

```
25638                                   ; ***************************************************************************
25639                                   .SBTTL T1002 BUT SERVICE TEST IN ROM LOCATION 350 - (CCC)
25640                                   ; ***************************************************************************
25641
25642                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25643
25644                                   ;ROM SEQ:       [116,350,351,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25645
25646                                   ;ACT BUTS:      37[004]100,116  /  16[350]016,017  /  26[017]010,010
25647
25648                                   ;EXEC   [351] BUPP=017 ("T" BIT TRAP)
25649
25650                                   ;CODES:         N / A
25651
25652                                   ;SYNC:          B05J2  (-)
25653
25654                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25655                                   ;               K5-5 STPM2 H
25656
25657  063416  012700  001002          T1002:  MOV     #1002,R0                ;LOAD R0 WITH TEST NO.
25658  063422  013701  063444                  MOV     @#I1002,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25659  063426  010605                          MOV     SP,R5           ;SAVE THE SP
25660  063430  010506                  R1002:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25661  063432  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25662  063436  012746  063444                  MOV     #I1002,-(SP)    ;MAKE NEW PC = I1002
25663  063442  000006                          RTT                     ;SET "T" BIT - GO TO I1002
25664
25665  063444  000257                  I1002:  CCC             ;CCC INSTRUCTION SHOULD SPRING TRAP
25666
25667  063446  104005                  E1002:  ERROR5                  ;BUT SERVICE IN 350 FAILED
25668  063450  063430                          R1002                   ;ERROR LOOP RETURN
25669
25670  063452  000004                  01002:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25671
```

```
25672                                   ; ***************************************************************************
25673                                   .SBTTL T1003 BUT SERVICE TEST IN ROM LOCATION 117 - (SCC)
25674                                   ; ***************************************************************************
25675
25676                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25677
25678                                   ;ROM SEQ:       [117,352,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25679
25680                                   ;ACT BUTS:      37[004]100,117  /  16[117]016,017  /  26[017]010,010
25681
25682                                   ;EXEC:          [352] BUPP=017 ("T" BIT TRAP)
25683
25684                                   ;CODES:         N / A
25685
25686                                   ;SYNC:          B05J2  (-)
25687
25688                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25689                                   ;               K5-5 STPM2 H
25690
25691  063454  012700  001003          T1003:  MOV     #1003,R0                ;LOAD R0 WITH TEST NO.
25692  063460  013701  063502                  MOV     @#I1003,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25693  063464  010605                          MOV     SP,R5           ;SAVE THE SP
25694  063466  010506                  R1003:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25695  063470  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25696  063474  012746  063502                  MOV     #I1003,-(SP)    ;MAKE NEW PC = I1003
25697  063500  000006                          RTT                     ;SET "T" BIT - GO TO I1003
25698
25699  063502  000277                  I1003:  SCC                     ;SCC INSTRUCTION SHOULD SPRING TRAP
25700
25701  063504  104005                  E1003:  ERROR5                  ;BUT SERVICE IN 117 FAILED
25702  063506  063466                          R1003                   ;ERROR LOOP RETURN
25703
25704  063510  000004                  01003:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25705
```

```
25706                                   ; ********************************************************************************
25707                                   .SBTTL T1004 BUT SERVICE TEST IN ROM LOCATION 324 - (RTS PC)
25708                                   ; ********************************************************************************
25709
25710                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25711
25712                                   ;ROM SEQ:       [124,323,324,325,017,015,TRAP MICROROUTINE] FC 1,6,10,6
25713
25714                                   ;ACT BUTS:      37[004]100,124  /  16[324]016,017  /  26[017]010,010
25715
25716                                   ;EXEC:          [325] BUPP=017 ("T" BIT TRAP)
25717
25718                                   ;CODES:         N / A
25719
25720                                   ;SYNC:          BOSJ2  (-)
25721
25722                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25723                                   ;               K5-5 STPM2 H
25724
25725  063512  012700  001004          T1004:  MOV     #1004,R0                ;LOAD R0 WITH TEST NO.
25726  063516  013701  063546                  MOV     @#I1004,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25727  063522  010605                          MOV     SP,R5           ;SAVE THE SP
25728  063524  010506                  R1004:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25729  063526  012746  063550                  MOV     #E1004,-(SP)    ;RTS WILL LOAD PC WITH E1004
25730  063532  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25731  063536  012746  063546                  MOV     #I1004,-(SP)    ;MAKE NEW PC = I1004
25732  063542  000257                          CCC                     ;SCOPE SYNC
25733  063544  000006                          RTT                     ;SET "T" BIT - GO TO I1004
25734
25735  063546  000207          ;       I1004:  RTS     PC              ;RTS INSTRUCTION SHOULD SPRING TRAP
25736
25737  063550  104005                  E1004:  ERROR5                  ;BUT SERVICE IN 324 FAILED
25738  063552  063524                          R1004                   ;ERROR LOOP RETURN
25739
25740  063554  000004                  01004:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25741
```

```
25742                                   ; ************************************************************************
25743                                   .SBTTL T1005 BUT SERVICE TEST IN ROM LOCATION 345 - (SOB RN,A)
25744                                   ; ************************************************************************
25745
25746                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25747
25748                                   ;ROM SEQ:       [130,342,343,345,347,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25749
25750                                   ;ACT BUTS:      37[004]100,130  /  16[345]016,017  /  26[017]010,010
25751
25752                                   ;EXEC:          [347] BUPP=017 ("T" BIT TRAP)
25753
25754                                   ;CODES:         N / A
25755
25756                                   ;SYNC:          B05J2  (-)
25757
25758                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25759                                   ;               K5-5 STPM2 H
25760
25761  063556  012700  001005          T1005:  MOV     #1005,R0                ;LOAD R0 WITH TEST NO.
25762  063562  013701  063626                  MOV     @#I1005,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25763  063566  032737  100000  066642          BIT     #100000,@#BPTLOC;BREAKPOINT HALT SET ??
25764  063574  001401                          BEQ     .+4             ;BR IF NOT
25765  063576  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
25766  063600  010605                          MOV     SP,R5           ;SAVE THE SP
25767  063602  010506                  R1005:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25768  063604  012703  000001                  MOV     #1,R3           ;SOB COUNT = +1
25769  063610  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25770  063614  012746  063626                  MOV     #I1005,-(SP)    ;MAKE NEW PC = I1005
25771  063620  000257                          CCC                     ;SCOPE SYNC
25772  063622  000006                          RTT                     ;SET "T" BIT - GO TO I1005
25773  063624  000401                          BR      E1005
25774
25775  063626  077302                  I1005:  SOB     R3,I1005-2      ;SOB INSTRUCTION SHOULD SPRING TRAP
25776
25777  063630  104005                  E1005:  ERROR5                  ;BUT SERVICE IN 345 FAILED
25778  063632  063602                          R1005                   ;ERROR LOOP RETURN
25779
25780  063634  000004                  01005:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25781
```

```
25782                                   ; ***************************************************************************
25783                                   .SBTTL T1006 BUT SERVICE TEST IN ROM LOCATION 344 - (SOB RA,A)
25784                                   ; ***************************************************************************
25785
25786                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25787
25788                                   ;ROM SEQ:       [130,342,343,344,346,017,015,TRAP MICROROUTINE] FC 1,7,10,6
25789
25790                                   ;ACT BUTS:      37[004]100,130  /  16[344]016,017  /  26[017]010,010
25791
25792                                   ;EXEC:          [346] BUPP=017 ("T" BIT TRAP)
25793
25794                                   ;CODES:         N / A
25795
25796                                   ;SYNC:          B05J2  (-)
25797
25798                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25799                                   ;               K5-5 STPM2 H
25800
25801  063636  012700  001006          T1006:  MOV     #1006,R0                ;LOAD R0 WITH TEST NO.
25802  063642  013701  063700                  MOV     @#I1006,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25803  063646  010605                          MOV     SP,R5           ;SAVE THE SP
25804  063650  010506                  R1006:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
25805  063652  012703  000002                  MOV     #2,R3           ;SOB COUNT = +2
25806  063656  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25807  063662  012746  063700                  MOV     #I1006,-(SP)    ;MAKE NEW PC = I1006
25808  063666  000257                          CCC                     ;SCOPE SYNC
25809  063670  000006                          RTT                     ;SET "T" BIT - GO TO I1006
25810  063672  104005                  E1006:  ERROR5                  ;BUT SERVICE IN 373 FAILED
25811  063674  063650                          R1006                   ;ERROR LOOP RETURN
25812  063676  000403                          BR      01006           ;GO TO SCOPE EXIT
25813
25814  063700  077304                  I1006:  SOB     R3,E1006                ;SOB INSTRUCTION SHOULD SPRING TRAP
25815
25816  063702  000240                          NOP                     ;TO BE COMPATIBLE WITH "T" BIT SERV.
25817  063704  000240                          NOP
25818
25819  063706  000004                  01006:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25820
```

```
25821                                   ; ***************************************************************************
25822                                   .SBTTL T1007 BUT SERVICE TEST IN ROM LOCATION 356 - (MARK 0)
25823                                   ; ***************************************************************************
25824
25825                                   ;MICROPROGRAMMING  /  LOGIC INFORMATION
25826
25827                                   ;ROM SEQ:       [112,353,354,355,356,357,017,015,TRAP MICROROUTINE]
25828                                   ;               FC 1,5,10,6
25829
25830                                   ;ACT BUTS:      37[004]100,112  /  016[356]016,017  /  26[017]010,010
25831
25832                                   ;EXEC:          [357]  BUPP = 017  ("T" BIT TRAP)
25833
25834                                   ;CODES:         N / A
25835
25836                                   ;SYNC:          BOSJ2  (-)
25837
25838                                   ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
25839                                   ;               K5-5 STPM2 H
25840
25841
25842  063710  012700  001007          T1007:  MOV     #1007,R0            ;LOAD R0 WITH TEST NO.
25843  063714  013701  063744                  MOV     @#I1007,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
25844  063720  010604                          MOV     SP,R4           ;SAVE THE SP
25845  063722  010406                  R1007:  MOV     R4,SP           ;RESTORE SP FOR ERROR LOOPING
25846  063724  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
25847  063730  012746  063744                  MOV     #I1007,-(SP)    ;MAKE NEW PC = I1007
25848  063734  012705  063754                  MOV     #A1007,R5               ;MARK GOES TO A1007 IF TRAP NOT SPRUNG
25849  063740  000257                          CCC                     ;SCOPE SYNC
25850  063742  000006                          RTT                     ;SET "T" BIT - GO TO I1007
25851
25852  063744  006401                  I1007:  MARK+1                  ;MRK INSTRUCTION SHOULD SPRING TRAP
25853
25854  063746  000000                          0                       ;"T" BIT SERVICE WILL PUSH THE "PSW"
25855  063750  000000                          0                       ;AND THE "PC" IN THESE LOCATIONS
25856  063752  000400                          BR      A1007           ;JUST IN CASE MARK FAILS
25857
25858  063754  010406                  A1007:  MOV     R4,SP           ;RESET THE SP
25859  063756  000401                          BR      E1007           ;GO REPORT ERROR
25860  063760  000402                          BR      B1007           ;"T" TRAP WORKED - GO TO EXIT
25861  063762  104005                  E1007:  ERROR5                  ;MRK FAILED TO SPRING "T" TRAP
25862  063764  063722                          R1007                   ;ERROR LOOP RETURN ADDRESS
25863
25864  063766  010406                  B1007:  MOV     R4,SP           ;RESET THE SP IF ALL OK
25865
25866  063770  000004                  01007:  SCOPE                   ;CALL SCOPE LOOP UTILITY
25867
25868
25869
25870
```

```
25871                                   ; ********************************************************************************
25872                                          .SBTTL T1010 ALU ADD FUNCTION TEST
25873                                   ; ********************************************************************************
25874
25875                                   ;THIS TEST VERIFIES THAT THE ALU ADD FUNCTION CAN RESPOND CORRECTLY
25876                                   ;TO THE 8 POSSIBLE COMBINATIONS THAT COULD OCCUR AT THE INPUTS OF
25877                                   ;EACH OF THE 16 BIT POSITIONS AS DESCRIBED BELOW:
25878
25879                                   ;       AIN     BIN     CIN
25880
25881                                   ;       0       0       0
25882                                   ;       0       0       1
25883                                   ;       0       1       0
25884                                   ;       0       1       1
25885                                   ;       1       0       0
25886                                   ;       1       0       1
25887                                   ;       1       1       0
25888                                   ;       1       1       1
25889
25890                                   ;THE TEST NO.S ALONG WITH THE CORRECT ANSWERS ARE STORED IN A TABLE
25891                                   ;TAGGED "ALUADD" AS SHOWN BELOW:
25892
25893                                           ;ALUADD:        NULL
25894                                   ;                       SRC OP1
25895                                   ;                       DST OP1
25896                                   ;                       SUM1
25897                                   ;                       SRC OP2
25898                                   ;                       DST OP2
25899                                   ;                       SUM2
25900                                   ;                       ETC.
25901
25902                                   ;UPON DETECTION OF AN ERROR THE PRINTOUT HAS THE FOLLOWING SIG-
25903                                   ;NIFICANCE IN COLUMNS 5-8:
25904
25905                                   ;       COL5 [R1] = SOURCE OPR
25906                                   ;       COL6 [R2] = DEST OPR
25907                                   ;       COL7 [R3] = WAS SUM
25908                                   ;       COL8 [R4] = S / B SUM
25909
25910                                   ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING PAIR
25911                                   ;OF NO.S IF SW09=1 OR GO ON TO THE NEXT PAIR IF SW09=0.
25912
25913  063772  012700  001010   T1010:  MOV     #1010,R0                ;LOAD R0 WITH TEST NO.
25914  063776  012705  067626           MOV     #ALUADD,R5      ;R5 POINTS TO TABLE OF NO.S
25915  064002  005725           L1010:  TST     (R5)+           ;POINT TO A SRC OP
25916  064004  022705  067710           CMP     #ALUADD+62,R5   ;DONE ALL NO.S IN TABLE ?
25917  064010  001416                   BEQ     01010           ;BR IF YES
25918  064012  012501                   MOV     (R5)+,R1        ;LOAD SRC OP
25919  064014  012503                   MOV     (R5)+,R3        ;LOAD DEST OP
25920  064016  000257                   CCC                     ;SCOPE SYNC
25921
25922  064020  060103           I1010:  ADD     R1,R3           ;TEST THE ADD FUNCTION
25923
25924  064022  021503                   CMP     (R5),R3         ;CORRECT SUM ?
25925  064024  001766                   BEQ     L1010           ;GO ADD NEXT PAIR IF YES
25926
```

```
25927  064026  011504                          MOV     (R5),R4         ;GET S / B SUM
25928  064030  014502                          MOV     -(R5),R2        ;GET DEST OP
25929  064032  104000                E1010:    ERROR                   ;ALU ADD OPERATION FAILED
25930  064034  064042                          R1010                   ;ERROR LOOP RETURN ADDRESS
25931
25932  064036  005725                          TST     (R5)+           ;CORRECT R5 POINTER
25933  064040  000760                          BR      L1010           ;GO DO NEXT PAIR
25934
25935  064042  024545                R1010:    CMP     -(R5),-(R5)     ;RESET R5 TO POINT TO BAD GUYS
25936  064044  000756                          BR      L1010           ;GO REPEAT FAILING PAIR
25937
25938  064046  000004                01010:    SCOPE                   ;CALL SCOPE LOOP UTILITY
25939
```

```
25940                           ; ************************************************************************
25941                                   .SBTTL T1011 ALU SUB FUNCTION TEST
25942                           ; ************************************************************************
25943
25944                           ;THIS TEST VERIFIES THAT THE ALU ADD FUNCTION CAN RESPOND CORRECTLY
25945                           ;TO THE 8 POSSIBLE COMBINATIONS THAT COULD OCCUR AT THE INPUTS OF
25946                           ;EACH OF THE 16 BIT POSITIONS AS DESCRIBED BELOW:
25947
25948                           ;       AIN     BIN     CIN
25949
25950                           ;       0       0       0
25951                           ;       0       0       1
25952                           ;       0       1       0
25953                           ;       0       1       1
25954                           ;       1       0       0
25955                           ;       1       0       1
25956                           ;       1       1       0
25957                           ;       1       1       1
25958
25959                           ;THE TEST NO.S ALONG WITH THE CORRECT ANSWERS ARE STORED IN A TABLE
25960                           ;TAGGED "ALUADD" AS SHOWN BELOW:
25961
25962                                   ;ALUSUB:        NULL
25963                           ;                       SRC OP1
25964                           ;                       DST OP1
25965                           ;                       DIFF1
25966                           ;                       SRC OP2
25967                           ;                       DST OP2
25968                           ;                       DIFF2
25969                           ;                       ETC.
25970
25971                           ;UPON DETECTION OF AN ERROR THE PRINTOUT HAS THE FOLLOWING SIG-
25972                           ;NIFICANCE IN COLUMNS 5-8:
25973
25974                           ;       COL5 [R1] = SOURCE OPR
25975                           ;       COL6 [R2] = DEST OPR
25976                           ;       COL7 [R3] = WAS DIFFERENCE
25977                           ;       COL8 [R4] = S / B DIFFERENCE
25978
25979                           ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING PAIR
25980                           ;OF NO.S IF SW09=1 OR GO ON TO THE NEXT PAIR IF SW09=0.
25981
25982  064050  012700  001011   T1011:  MOV     #1011,R0                ;LOAD R0 WITH TEST NO.
25983  064054  012705  070054           MOV     #ALUSUB,R5      ;R5 POINTS TO TABLE OF NO.S
25984  064060  005725           L1011:  TST     (R5)+           ;POINT TO A SRC OP
25985  064062  022705  070136           CMP     #ALUSUB+62,R5   ;DONE ALL NO.S IN TABLE ?
25986  064066  001416                   BEQ     01011           ;BR IF YES
25987  064070  012501                   MOV     (R5)+,R1        ;LOAD SRC OP
25988  064072  012503                   MOV     (R5)+,R3        ;LOAD DEST OP
25989  064074  000257                   CCC                     ;SCOPE SYNC
25990
25991  064076  160103           I1011:  SUB     R1,R3           ;TEST THE SUB FUNCTION
25992
25993  064100  021503                   CMP     (R5),R3         ;CORRECT DIFF. ?
25994  064102  001766                   BEQ     L1011           ;GO SUB NEXT PAIR IF YES
25995
```

```
25996  064104  011504                          MOV     (R5),R4         ;GET S / B DIFF
25997  064106  014502                          MOV     -(R5),R2        ;GET DEST OP
25998  064110  104000                E1011:    ERROR                   ;ALU SUB OPERATION FAILED
25999  064112  064120                          R1011                   ;ERROR LOOP RETURN ADDRESS
26000
26001  064114  005725                          TST     (R5)+           ;CORRECT R5 POINTER
26002  064116  000760                          BR      L1011           ;GO DO NEXT PAIR
26003
26004  064120  024545                R1011:    CMP     -(R5),-(R5)     ;RESET R5 TO POINT TO BAD GUYS
26005  064122  000756                          BR      L1011           ;GO REPEAT FAILING PAIR
26006
26007  064124  000004                01011:    SCOPE                   ;CALL SCOPE LOOP UTILITY
26008
26009
26010
26011
26012
```

```
26013                                   ; ***************************************************************************
26014                                           .SBTTL T1012 ALU "AND" FUNCTION TEST USING BIC INSTRUCTION
26015                                   ; ***************************************************************************
26016
26017                                   ;THIS TEST VERIFIES THAT THE ALU "AND" FUNCTION RESPONDS CORRECTLY
26018                                   ;TO ALL POSSIBLE COMBINATIONS FOR EACH OF THE 16 BIT POSITIONS
26019                                   ;IT  EXECUTES THE BIC INSTRUCTION FOR THE FOLLOWING PAIRS OF
26020                                   ;OPERANDS AND TESTS FOR THE INDICATED RESULT:
26021
26022                                           ;SOURCE OP      DEST. OP        RESULT
26023
26024                                           ;000000         000000          000000
26025                                           ;177777         177777          000000
26026                                           ;000000         177777          177777
26027                                           ;177777         000000          000000
26028                                           ;125252         125252          000000
26029                                           ;052525         052525          000000
26030                                           ;125252         052525          052525
26031                                           ;052525         125252          125252
26032
26033                                   ;THE 8 PAIRS OF NO.S AND THE ANSWERS ARE STORED IN A TEBLE TAGGED
26034                                   ;"ANDTAB" IN THE FOLLOWING PATTERN:
26035                                           ;ANDTAB:        NULL
26036                                   ;                       SRC OP1
26037                                   ;                       DST OP1
26038                                   ;                       ANS1
26039                                   ;                       SRC OP2
26040                                   ;                       DST OP2
26041                                   ;                       ANS2
26042                                   ;                       ETC.
26043
26044                                   ;WHEN AN ERROR IS REPORTED THE PRINTOUT IN COL. 5-8 HAS THE
26045                                   ;FOLLOWING SIGNIFICANCE:
26046
26047                                   ;       COL 5 [R1] = SOURCE OPR
26048                                   ;       COL 6 [R2] = DEST OPR
26049                                   ;       COL 7 [R3] = WAS ANSWER
26050                                   ;       COL 8 [R4] = S / B ANSWER
26051
26052                                   ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING
26053                                   ;PAIR OF NO.S IF SW09=1 OR GO ON TO TEST THE NEXT PAIR IF SW09=0
26054
26055  064126  012700  001012          T1012:  MOV     #1012,R0                ;LOAD R0 WITH TEST NO.
26056  064132  012705  067710                  MOV     #ANDTAB,R5      ;R5 POINTS TO TABLE OF TEST NO.S
26057  064136  005725                  L1012:  TST     (R5)+           ;POINT TO A SOURCE OPR
26058  064140  022705  067772                  CMP     #ANDTAB+62,R5   ;DONE ALL COMBINATIONS ?
26059  064144  001416                          BEQ     01012           ;BR IF YES
26060  064146  012501                          MOV     (R5)+,R1        ;LOAD THE SRC OP
26061  064150  012503                          MOV     (R5)+,R3        ;LOAD THE DEST OP
26062  064152  000257                          CCC                     ;SCOPE SYNC
26063
26064  064154  040103                  I1012:  BIC     R1,R3           ;TEST THE "AND"
26065
26066  064156  020315                          CMP     R3,(R5)         ;RESULT CORRECT ?
26067  064160  001766                          BEQ     L1012           ;BR IF YES - GET THE NEXT PAIR
26068
```

```
 26069  064162  011504                        MOV     (R5),R4         ;GET THE S / B DATA
 26070  064164  014502                        MOV     -(R5),R2        ;GET DEST OP
 26071  064166  104000              E1012:    ERROR                   ;ALU "AND" FAILED
 26072  064170  064176                        R1012                   ;ERROR LOOP RETURN
 26073
 26074  064172  005725                        TST     (R5)+           ;CORRECT R5 POINTER
 26075  064174  000760                        BR      L1012           ;GO GET NEXT PAIR
 26076
 26077  064176  024545              R1012:    CMP     -(R5),-(R5)     ;RESET R5 TO POINT BACK TO BAD GUYS
 26078  064200  000756                        BR      L1012           ;GO REPEAT THE BAD GUYS
 26079
 26080  064202  000004              01012:    SCOPE                   ;CALL SCOPE LOOP UTILITY
 26081
 26082
```

```
26083                           ; ************************************************************************
26084                                   .SBTTL T1013 ALU "OR" FUNCTION TEST USING BIS INSTRUCTION
26085                           ; ************************************************************************
26086
26087                           ;THIS TEST VERIFIES THAT THE ALU "OR" FUNCTION RESPONDS CORRECTLY
26088                           ;TO ALL POSSIBLE COMBINATIONS FOR EACH OF THE 16 BIT POSITIONS
26089                           ;IT  EXECUTES THE BIS INSTRUCTION FOR THE FOLLOWING PAIRS OF
26090                           ;OPERANDS AND TESTS FOR THE INDICATED RESULT:
26091
26092                                   ;SOURCE OP      DEST. OP        RESULT
26093
26094                                   ;000000         000000          000000
26095                                   ;177777         177777          177777
26096                                   ;000000         177777          177777
26097                                   ;177777         000000          177777
26098                                   ;125252         125252          125252
26099                                   ;052525         052525          052525
26100                                   ;125252         052525          177777
26101                                   ;052525         125252          177777
26102
26103                           ;THE 8 PAIRS OF NO.S AND THE ANSWERS ARE STORED IN A TABLE TAGGED
26104                           ;"ORTAB" IN THE FOLLOWING PATTERN:
26105                                   ;ORTAB: NULL
26106                           ;                       SRC OP1
26107                           ;                       DST OP1
26108                           ;                       ANS1
26109                           ;                       SRC OP2
26110                           ;                       DST OP2
26111                           ;                       ANS2
26112                           ;                       ETC.
26113
26114                           ;WHEN AN ERROR IS REPORTED THE PRINTOUT IN COL. 5-8 HAS THE
26115                           ;FOLLOWING SIGNIFICANCE:
26116
26117                           ;       COL 5 [R1] = SOURCE OPR
26118                           ;       COL 6 [R2] = DEST OPR
26119                           ;       COL 7 [R3] = WAS ANSWER
26120                           ;       COL 8 [R4] = S / B ANSWER
26121
26122                           ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING
26123                           ;PAIR OF NO.S IF SW09=1 OR GO ON TO TEST THE NEXT PAIR IF SW09=0
26124
26125  064204  012700  001013   T1013:  MOV     #1013,R0                ;LOAD R0 WITH TEST NO.
26126  064210  012705  067772           MOV     #ORTAB,R5       ;R5 POINTS TO TABLE OF TEST NO.S
26127  064214  005725           L1013:  TST     (R5)+           ;POINT TO A SOURCE OPR
26128  064216  022705  070054           CMP     #ORTAB+62,R5    ;DONE ALL COMBINATIONS ?
26129  064222  001416                   BEQ     01013           ;BR IF YES
26130  064224  012501                   MOV     (R5)+,R1        ;LOAD THE SRC OP
26131  064226  012503                   MOV     (R5)+,R3        ;LOAD THE DEST OP
26132  064230  000257                   CCC                     ;SCOPE SYNC
26133
26134  064232  050103           I1013:  BIS     R1,R3           ;TEST THE "OR"
26135
26136  064234  020315                   CMP     R3,(R5)         ;RESULT CORRECT ?
26137  064236  001766                   BEQ     L1013           ;BR IF YES - GET THE NEXT PAIR
26138
```

```
26139  064240  011504                          MOV     (R5),R4         ;GET THE S / B DATA
26140  064242  014502                          MOV     -(R5),R2        ;GET DEST OP
26141  064244  104000                E1013:    ERROR                   ;ALU "OR" FAILED
26142  064246  064254                          R1013                   ;ERROR LOOP RETURN
26143
26144  064250  005725                          TST     (R5)+           ;CORRECT R5 POINTER
26145  064252  000760                          BR      L1013           ;GO GET NEXT PAIR
26146
26147  064254  024545                R1013:    CMP     -(R5),-(R5)     ;RESET R5 TO POINT BACK TO BAD GUYS
26148  064256  000756                          BR      L1013           ;GO REPEAT THE BAD GUYS
26149
26150  064260  000004                01013:    SCOPE                   ;CALL SCOPE LOOP UTILITY
26151
26152
26153
26154
26155
26156
26157
```

```
                                ; ************************************************************************
                                        .SBTTL T1014 INC / DEC / ADD TEST - CYCLE NO.S 000000-077777
                                ; ************************************************************************

                                ;THIS TEST COMBINES THE INC / DEC / ADD INSTRUCTIONS IN THE FOLLOWING
                                ;TEST SEQUENCE:

                                        ;1. BOTH SOURCE AND DEST OPS ARE ZEROED
                                        ;2. THE TWO NO.S ARE ADDED AND THE RESULT COMPARED WITH 000000
                                        ;3. THE SOURCE OP IS INCREMENTED
                                        ;4. THE DEST OP IS DECREMENTED
                                        ;5. STEPS 2,3, AND 4 ARE REPEATED UNTIL THE SOURCE OP GOES
                                        ;   NEGATIVE

                                ;ON DETECTION OF A NON-ZERO RESULT THE ERROR IS REPORTED AND THEN IF:

                                ;       1. SW09=0  THE SCOPE LOOP UTILITY IAS CALLED TO REINITIALIZE
                                ;                  THE TEST
                                ;       2. SW09=1  THE ROUTINE LOCKS ON THE FAILING PAIR OF OPERANDS
                                ;                  UNTIL THE ERROR GOES AWAY OR SW09 IS RESET

                                ;THE SIGNIFICANCE OF THE PRINTOUT IN COLUMNS 5 - 8:

                                        ;COLUMN 5       [R1] SOURCE OP
                                        ;COLUMN 6       [R2] DEST OP
                                        ;COLUMN 7       [R3] WAS ANSWER
                                        ;COLUMN 8       [R4] S / B ANSWER (ALWAYS 000000)

064262  012700  001014          T1014:  MOV     #1014,R0                ;LOAD R0 WITH TEST NO.
064266  005001                  CLR     R1              ;INITIALIZE REGS TO 000000
064270  005002                  CLR     R2
064272  005004                  CLR     R4
064274  010203          R1014:  MOV     R2,R3           ;LOAD DEST OPERAND
064276  000257                  CCC                     ;SCOPE SYNC

064300  060103          I1014:  ADD     R1,R3           ;ADD THE TWO TEST NO.S
                                                        ;RESULT S / B = 000000

064302  020403                  CMP     R4,R3           ;RESULT = 000000 ?
064304  001403                  BEQ     A1014           ;BR IF YES

064306  104000          E1014:  ERROR                   ;INCORRECT RESULT IN R3
064310  064274                  R1014                   ;ERROR LOOP RETURN

064312  000404                  BR      01014           ;GO TO SCOPE EXIT

064314  005201          A1014:  INC     R1              ;ADD 1 TO SOURCE OP
064316  100402                  BMI     01014           ;GET OUT IF IT WENT NEGATIVE
064320  005302                  DEC     R2              ;SUB 1 FROM THE DEST OP
064322  000764                  BR      R1014           ;GO ADD THE TWO NO.S

064324  000004          01014:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T1015 INC / DEC / ADD TEST - CYCLE NO.S 077777-000000
                                ; ************************************************************************

                                ;THIS TEST COMBINES THE INC / DEC / ADD INSTRUCTIONS IN THE FOLLOWING
                                ;TEST SEQUENCE:

                                        ;1. BOTH SOURCE AND DEST OPS ARE ZEROED
                                        ;2. THE TWO NO.S ARE ADDED AND THE RESULT COMPARED WITH 000000
                                        ;3. THE SOURCE OP IS DECREMENTED
                                        ;4. THE DEST OP IS INCREMENTED
                                        ;5. STEPS 2,3, AND 4 ARE REPEATED UNTIL THE DEST. OP GOES
                                        ;   NEGATIVE

                                ;ON DETECTION OF A NON-ZERO RESULT THE ERROR IS REPORTED AND THEN IF:

                                ;       1. SW09=0  THE SCOPE LOOP UTILITY IAS CALLED TO REINITIALIZE
                                ;                  THE TEST
                                ;       2. SW09=1  THE ROUTINE LOCKS ON THE FAILING PAIR OF OPERANDS
                                ;                  UNTIL THE ERROR GOES AWAY OR SW09 IS RESET

                                ;THE SIGNIFICANCE OF THE PRINTOUT IN COLUMNS 5 - 8:

                                        ;COLUMN 5       [R1] SOURCE OP
                                        ;COLUMN 6       [R2] DEST OP
                                        ;COLUMN 7       [R3] WAS ANSWER
                                        ;COLUMN 8       [R4] S / B ANSWER (ALWAYS 000000)

064326  012700  001015      T1015:  MOV     #1015,R0                ;LOAD R0 WITH TEST NO.
064332  005001              CLR     R1              ;INITIALIZE REGS TO 000000
064334  005002              CLR     R2
064336  005004              CLR     R4
064340  010203      R1015:  MOV     R2,R3           ;LOAD DEST OPERAND
064342  000257              CCC                     ;SCOPE SYNC

064344  060103      I1015:  ADD     R1,R3           ;ADD THE TWO TEST NO.S
                                                    ;RESULT S / B = 000000

064346  020403              CMP     R4,R3           ;RESULT = 000000 ?
064350  001403              BEQ     A1015           ;BR IF YES

064352  104000      E1015:  ERROR                   ;INCORRECT RESULT IN R3
064354  064340              R1015                   ;ERROR LOOP RETURN

064356  000404              BR      01015           ;GO TO SCOPE EXIT

064360  005202      A1015:  INC     R2              ;ADD 1 TO DEST. OP
064362  100402              BMI     01015           ;GET OUT IF IT WENT NEGATIVE
064364  005301              DEC     R1              ;SUB 1 FROM THE SOURCE OP
064366  000764              BR      R1015           ;GO ADD THE TWO NO.S

064370  000004      01015:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
26263                                   ; ***************************************************************************
26264                                           .SBTTL END OF PASS SERVICE ROUTINE
26265                                   ; ***************************************************************************
26266
26267  064372  010037  066706          ENDPS:  MOV     R0,@#LAST       ;SAVE LAST TEST NO. FOR
26268                                                                  ;MISSED TEST ERROR CHECK
26269  064376  004737  064564                  JSR     PC,@#MISS       ;GO CHECK FOR MISSED TESTS
26270  064402  005237  066670          1$:     INC     @#PASCNT        ;UPDATE THE PASS COUNTER
26271  064406  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT END PASS PRINTOUT ?
26272  064414  001035                          BNE     6$              ;BR IF YES
26273  064416  104400                          TYPE
26274  064420  067147                          EOP1
26275  064422  013702  066670                  MOV     @#PASCNT,R2     ;CONVERT AND PRINT PASS COUNT
26276  064426  004737  065760                  JSR     PC,@#OTA
26277  064432  104400                          TYPE
26278  064434  067136                          DIGITS
26279  064436  104400                          TYPE
26280  064440  067176                          EOP2
26281  064442  013702  066666                  MOV     @#ERRCNT,R2     ;CONVERT AND PRINT ERROR COUNT
26282  064446  004737  065760                  JSR     PC,@#OTA
26283  064452  104400                          TYPE
26284  064454  067136                          DIGITS
26285  064456  005737  066672                  TST     @#PFCNT         ;ANY POWER FAILS LOGGED THIS PASS?
26286  064462  001410                          BEQ     2$              ;BR IF NONE
26287  064464  013702  066672                  MOV     @#PFCNT,R2      ;GET THE PWR FAIL COUNT
26288  064470  004737  065760                  JSR     PC,@#OTA        ;GO CONVERT PFCNT
26289  064474  104400                          TYPE
26290  064476  067163                          PFMESS
26291  064500  104400                          TYPE                    ;TYPE "PFCNT = NNNNNN
26292  064502  067136                          DIGITS
26293  064504  104400                  2$:     TYPE
26294  064506  066726                          CRLF
26295  064510  012737  000040  066662  6$:     MOV     #32.,@#ICOUNT
26296  064516  012737  000040  066664          MOV     #32.,@#ITCNT
26297  064524  012701  066674          PFRET:  MOV     #PRIFLG,R1      ;R1 POINTS TO BEGINNING OF FLAGS
26298  064530  005021                  1$:     CLR     (R1)+           ;CLEAR A FLAG
26299  064532  022701  066722                  CMP     #ONCE,R1        ;ALL DONE?
26300  064536  001374                          BNE     1$              ;BR IF NOT
26301  064540  000005                          RESET                   ;CLEAR THE WORLD PRIOR TO RESTART
26302  064542  013702  000042                  MOV     @#42,R2         ;CHECK FOR XXDP/ACT11 HOOK
26303  064546  001404                          BEQ     DONE1           ;BR IF NO HOOK FOUND
26304  064550  004712                  LOGICAL:JSR     PC,(R2)         ;RETURN TO XXDP OR ACT MONITOR
26305  064552  000240                          NOP
26306  064554  000240                          NOP
26307  064556  000240                          NOP
26308  064560  000137  003034          DONE1:  JMP     @#BEGIN         ;GO RESTART AT THE BEGINNNING
```

```
26309                                   ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
26310                                           .SBTTL  /  /  /  /  /  /  UTILITIES  /  /  /  /  /  /
26311                                   ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
26312                                   .SBTTL
26313                                   ; ************************************************************************
26314                                           .SBTTL SUBROUTINE TO CHECK FOR AND REPORT MISSED TESTS
26315                                   ; ************************************************************************
26316
26317                                   ;THERE IS A BYTE TABLE TAGGED "STAB1" THAT IS MAINTAINED BY THE SCOPE
26318                                   ;LOOP SERVICE ROUTINE. EACH TIME A TEST IN THE "CIT" OR "IEX" SECTION
26319                                   ;IS ENTERED A CORRESPONDING BYTE IN THE TABLE IS SET TO 377.
26320                                   ;DURING THE "BIT" SECTION OF THE PROGRAM A "MOVB  #377,STAB1(R0)"
26321                                   ;IS USED TO FLAG EACH TEST ENTERED SINCE THE "SCOPE" TRAP HAS NOT BEEN
26322                                   ;VERIFIED YET.
26323                                   ;EACH ENTRY INDEX CORRESPONDS TO AN OCTAL TEST #. THE TABLE IS CLEARED
26324                                   ;UPON ENTRY INTO THE "CIT" SECTION AND MAINTAINED BY THE SCOPE LOOP
26325                                   ;SERVICE UNTIL END OF PASS SERVICE. THIS ROUTINE IS CALLED THEN TO
26326                                   ;SCAN THE TABLE AND REPORT ANY MISSED TESTS. THIS ERROR CHECKING CAN
26327                                   ;BE INHIBITED BY SETTING SW12 TO A"1". THE ERROR PRINTOUT HAS THE
26328                                   ;FORMAT SHOWN BELOW:
26329
26330
26331                                   ;       MISSED TEST
26332                                   ;       NNN
26333                                   ;       MMM
26334                                   ;       XXX
26335
26336                                   ;       ETC
26337
26338                                   ;       WHERE: THE HEADER IS PRINTED ONLY ONCE AND NNN,MMM,XXX,
26339                                   ;       ETC ARE THE OCTAL NO.S OF THE MISSED TESTS.
26340
26341
26342 064564  032737  010000  177570  MISS:   BIT     #SW12,@#SR      ;INHIBIT MISSED TEST PRINTOUT ?
26343 064572  001044                          BNE     5$              ;BR IF YES
26344 064574  032737  020000  177570          BIT     #SW13,@#SR      ;INHIBIT PRINT ?
26345 064602  001040                          BNE     5$              ;BR IF YES
26346 064604  013700  066704                  MOV     @#FIRST,R0      ;USE TEST NO. AS INDEX TO ERROR TABLE
26347 064610  013701  066706                  MOV     @#LAST,R1       ;USE [R1] TO INDICATE END OF MISSED
26348                                                                   ;TEST ERROR TABLE
26349 064614  122760  000377  070162  2$:     CMPB    #377,STAB1(R0)  ;WAS TEST FLAG = 377 ?
26350 064622  001424                          BEQ     4$              ;BR IF YES - TEST EXECUTED
26351 064624  005737  066710                  TST     @#MISFLG        ;HEADER PRINTED ?
26352 064630  001004                          BNE     3$              ;BR IF YES - PRINT ONLY ONCE
26353 064632  104400                          TYPE                    ;GO TYPE "MISSED TESTS"
26354 064634  067477                          MISHDR
26355 064636  005137  066710                  COM     @#MISFLG        ;SET FLAG TO PREVENT PRINTING AGAIN
26356 064642  010002                  3$:     MOV     R0,R2           ;GET THE TEST NO.
26357 064644  004737  065760                  JSR     PC,@#OTA        ;GO CONVERT AND PRINT THE NO.
26358 064650  104400                          TYPE
26359 064652  067136                          DIGITS
26360 064654  104400                          TYPE
26361 064656  066726                          CRLF
26362 064660  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
26363 064666  001402                          BEQ     4$              ;BR IF YES
26364 064670  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
```

```
26365  064674  020001                4$:     CMP     R0,R1           ;DONE ALL TABLE ENTRIES ?
26366  064676  001402                        BEQ     5$              ;BR IF YES
26367  064700  005200                        INC     R0              ;INDEX POINTS TO NEXT TEST FLAG
26368  064702  000744                        BR      2$              ;GO CHECK THE NEXT FLAG
26369  064704  000207                5$:     RTS     PC              ;RETURN TO END OF PASS SERVICE
26370
```

```
26371                                   ; ***************************************************************************
26372                                           .SBTTL POWER FAIL SUBROUTINE
26373                                   ; ***************************************************************************
26374
26375  064706  012737  064746  000024  PDWN:   MOV     #PUP,@#24       ;SET UP POWER FAIL VECTOR TO GO
26376  064714  012737  000340  000026          MOV     #340,@#26       ;TO PUP ON POWER UP - LEVEL 7
26377  064722  005237  066672                  INC     @#PFCNT         ;COUNT THE POWER FAIL
26378  064726  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
26379  064734  001402                          BEQ     1$              ;BR IF YES
26380  064736  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
26381  064742  000000                  1$:     HALT                    ;PWR RESTART SHOULD GO TO "PUP"
26382  064744  000776                          BR      1$              ;HANG IF CONTINUE DEPRESSED
26383
26384  064746  012737  000340  177776  PUP:    MOV     #340,@#PSW      ;SET PRIORITY TO LEVEL 7 JUST IN CASE
26385  064754  012706  001000                  MOV     #BTOO1,SP       ;RESET THE STACK POINTER
26386  064760  005037  067602                  CLR     @#MBUFO         ;INIT STALL COUNTER
26387  064764  005337  067602          1$:     DEC     @#MBUFO         ;COUNT ONE TIME
26388  064770  001375                          BNE     1$              ;BR IF NOT BACK TO 000000
26389  064772  012737  064706  000024          MOV     #PDWN,@#24      ;SET UP POWER FAIL VECTOR
26390  065000  012737  000340  000026          MOV     #340,@#26       ;PRIORITY LEVEL 7
26391  065006  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT POWER FAIL MESSAGE ?
26392  065014  001002                          BNE     2$              ;BR IF YES
26393  065016  104400                          TYPE                    ;GO PRINT POWER MESSAGE
26394  065020  067440                          PFMSG
26395  065022  000137  064524          2$:     JMP     @#PFRET         ;GO CLEANUP AND ATTEMPT RESTART
26396
26397
26398                                   ; ***************************************************************************
26399                                           .SBTTL "T" BIT SERVICE ROUTINE
26400                                   ; ***************************************************************************
26401
26402  065026  062716  000004          TBSER:  ADD     #4,(SP)         ;MOVE RETURN PC AROUND ERROR WORDS
26403  065032  042766  000020  000002          BIC     #20,2(SP)       ;TURN OFF THE "T" BIT
26404  065040  000006                          RTT                     ;RETURN TO THE CALLING TEST
26405
26406
```

```
                                ; ************************************************************************
                                        .SBTTL  RSVD INSTRUCTION TRAP SERVICE ROUTINE
                                ; ************************************************************************

                                ;THIS ROUTINE SERVICES UNEXPECTED RESERVED INSTRUCTION TRAP ERRORS
                                ;IT RESULTS IN PRINTING THE ERROR MESSAGE: "TRAPPED TO 10 PC=XXXXXX"
                                ;WHERE XXXXXX IS THE ADDRESS CONTAINING THE INSTRUCTION WORD THAT
                                ;SPRUNG THE TRAP.  AFTER PRINTING THE ERROR MESSAGE AN ATTEMPT IS
                                ;MADE TO RESTART THE PROGRAM AT THE BEGINNING.

                                ;IF THE TRAP IS SPRUNG WHILE IN THE PROCESS OF TRYING TO SERVICE A
                                ;PREVIOUS RSVD INSTRUCTION TRAP OR AN UNEXPECTED BUS ERROR THE PROGRAM
                                ;WILL HALT.  AFTER THE HALT THE STACK WILL CONTAIN INFORMATION RELATIVE
                                ;TO THE TWO SUCCESSIVE TRAPS AS SHOWN BELOW:

                                        ;[SP]   PC+2    OF 2ND TRAP
                                        ;[SP]+2 PSW       "
                                        ;[SP]+4 PC+2    OF 1ST TRAP
                                        ;[SP]+6 PSW       "

                                        ;LOCATION "CATERR" CAN BE EXAMINED TO OBTAIN THE FOLLOWING
                                        ;INFORMATION:

                                                ;[CATERR]=401   RSVD INSTR TRAP COMBINED WITH A BUS ERROR
                                                                ;TRAP (PC AT TIME OF ERROR HALT INDICATES
                                                                ;WHICH OCCURRED FIRST)
                                                ;[CATERR]=2     TWO SUCCESSIVE BUS ERROR TRAPS
                                                ;[CATERR]=1000  TWO SUCCESSIVE RSVD INSTR TRAPS

                                ;THE CONTENTS OF R0 (DISPLAYED IN THE DATA LIGHTS) AT THE TIME OF THE
                                ;HALT PROVIDES FURTHER INFORMATION AS TO THE LAST TEST BEING EXECUTED
                                ;WHEN THE TRAPS OCCURRED.


                                ;THESE TWO INSTRUCTIONS ARE USED BY THE BASIC INSTRUCTION
                                ;TESTS TO VERIFY THE RSVD INSTR TRAP MECHANISM PRIOR TO ACTIVATING THE SERVICE
                                ;ROUTINE

065042  005167  001644        RSVTST: COM     RSVFLG          ;SET RSVD INSTR TRAP TEST FLAG
065046  000002                        RTI                     ;RETURN TO BASIC TEST

065050  005737  066720        RSERR:  TST     @#CATERR        ;ANY PENDING CATASTROPHIC ERRORS
065054  001032                        BNE     2$              ;BE IF YES
065056  105237  066721                INCB    @#1+CATERR      ;SET RSVD INSTR FLAG
065062  032737  010000  177570        BIT     #SW12,@#SR      ;INHIBIT ERROR PRINT ?
065070  001020                        BNE     1$              ;BR IF YES
065072  104400                        TYPE                    ;GO TYPE "TRAPPED TO 10 PC="
065074  067520                        RSMSG
065076  011602                        MOV     (SP),R2         ;GET, CONVERT AND PRINT CONTENTS
065100  005742                        TST     -(R2)
065102  004737  065760                JSR     PC,@#OTA        ;OF THE OC
065106  104400                        TYPE
065110  067136                        DIGITS
065112  104400                        TYPE                    ;OUTPUT CR / LF
065114  066726                        CRLF
065116  022737  177777  066666        CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
```

```
 26463  065124  001402                          BEQ     1$              ;BR IF YES
 26464  065126  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
 26465  065132  012706  001000          1$:     MOV     #BTD01,SP
 26466  065136  000137  064524                  JMP     @#PFRET         ;GO ATTEMPT RESTART
 26467  065142  105237  066721          2$:     INCB    @#1+CATERR      ;INCREMENT RSVD INSTR FLAG
 26468  065146  000000                          HALT                    ;CATASTROPHIC ERROR HALT
 26469  065150  000770                          BR      1$              ;DEPRESSING CONTINUE WILL CAUSE
 26470                                                                  ;ATTEMPT TO RESTART.
 26471
```

```
26472                                   ; ***************************************************************************
26473                                          .SBTTL  BUS ERROR TRAP SERVICE ROUTINE
26474                                   ; ***************************************************************************
26475
26476                                   ;THIS ROUTINE SERVICES UNEXPECTED BUS ERROR TRAPS (BUS TIMEOUT, ODD ADDRESS
26477                                   ;ERRORS, STACK OVERFLOW, AND ILLEGAL INSTRUCTIONS). IT RESULTS IN PRINTING THE
26478                                   ;ERROR MESSAGE: "TRAPPED TO 4 PC =XXXXXX" WHERE XXXXXX IS THE
26479                                   ;CONTENTS OF THE PC WHEN THE TRAP WAS SPRUNG.  AFTER PRINTING THE
26480                                   ;ERROR MESSAGE AN ATTEMPT IS MADE TO RESTART THE PROGRAM AT
26481                                   ;THE BEGINNING.
26482
26483                                   ;IF THE TRAP IS SPRUNG WHILE IN THE PROCESS OF TRYING TO SERVICE A PREVIOUS
26484                                   ;RSVD INSTR TRAP OR A PREVIOUS BUS ERROR, THE PROGRAM WILL HALT.
26485                                   ;AFTER THE HALT THE STACK WILL CONTAIN INFORMATION RELATIVE TO THE
26486                                   ;TWO SUCCESSIVE TRAPS AS SHOWN BELOW:
26487
26488                                           ;[SP]   PC+2    OF 2ND TRAP
26489                                           ;[SP]+2 PSW       "
26490                                           ;[SP]+4 PC+2    OF 1ST TRAP
26491                                           ;[SP]+6 PSW       "
26492
26493
26494                                           ;LOCATION "CATERR" CAN BE EXAMINED TO OBTAIN THE LOLLOWING
26495                                           ;INFORMATION:
26496
26497                                                   ;[CATERR]=401   RSVD INSTR TRAP COMBINED WITH A BUS ERROR
26498                                                                   ;TRAP (PC AT TIME OF ERROR HALT
26499                                                                   ;INDICATES WHICH OCCURRED FIRST)
26500                                                   ;[CATERR]=2     TWO SUCCESSIVE BUS ERRORS
26501                                                   ;[CATERR]=1000  TWO SUCCESSIVE RSVD INSTR TRAPS
26502
26503                                   ;THE CONTENTS OF R0 (DISPLAYED IN THE DATA LIGHTS) AT THE TIME OF
26504                                   ;THE HALT PROVIDED FURTHER INFORMATION AS TO THE TEST IN PROGRESS
26505                                   ;WHEN THE TRAPS OCCURRED.
26506
26507                                   ;THE CONTENTS OF THE SP CAN BE USED TO INDICATE IF STACK OVERFLOW CAUSED
26508                                   ;THE BUSS ERROR TRAP(S) AS SHOWN BELOW:
26509
26510                                           ;400>[SP]>336   YELLOW ZONE
26511                                           ;[SP]=0         RED ZONE
26512
26513                                   ;THESE TWO INSTRUCTIONS ARE USED BY THE BASIC INSTRUCTION TESTS TO
26514                                   ;VERIFY THAT THE BUS ERROR TRAP MECHANISM WORKS PRIOR TO ACTIVATING
26515                                   ;THE SERVICE ROUTINE
26516
26517  065152  005167  001536         BETST:  COM     BERFLG          ;SET BUS ERROR TRAP TEST FLAG
26518  065156  000002                         RTI                     ;RETURN TO BASIC TEST
26519
26520  065160  005737  066720         BERR:   TST     @#CATERR        ;ANY CATASTROPHIC ERRORS PENDING?
26521  065164  001031                         BNE     2$              ;BR IF YES
26522  065166  105237  066720                 INCB    @#CATERR        ;SET CATASTROPHIC ERROR FLAG
26523  065172  032737  010000  177570       BIT     #SW12,@#SR      ;INHIBIT ERROR PRINT
26524  065200  001017                         BNE     1$              ;BR IF YES
26525  065202  104400                         TYPE                    ;PRINT "TRAP TO 4" MESSAGE
26526  065204  067452                         BEMSG
26527  065206  011602                         MOV     (SP),R2         ;GET TRAP PC FROM STACK
```

```
 26528  065210  004737  065760                  JSR     PC,@#OTA        ;CONVERT IT TO ASCII
 26529  065214  104400                          TYPE                    ;GO TYPE TRAP PC
 26530  065216  067136                          DIGITS
 26531  065220  104400                          TYPE                    ;GO OUTPUT CR / LF
 26532  065222  066726                          CRLF
 26533  065224  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
 26534  065232  001402                          BEQ     1$              ;BR IF YES
 26535  065234  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
 26536  065240  012706  001000          1$:     MOV     #BTO01,SP       ;RESET THE STACK POINTER
 26537  065244  000137  064524                  JMP     @#PFRET         ;GO CLEANUP FOR RESTART
 26538
 26539  065250  105237  066720          2$:     INCB    @#CATERR        ;SET CATASTROPHIC ERROR FLAG
 26540  065254  000000                          HALT                    ;CATASTROPHIC ERROR HALT-SCHOOLS OUT
 26541  065256  000770                          BR      1$              ;DEPRESS CONTINUE TO ATTEMPT RESTART
 26542
 26543
 26544
 26545
```

```
                                ; ****************************************************************
                                        .SBTTL SCOPE SERVICE ROUTINE
                                ; ****************************************************************

                                ;THIS UTILITY IS CALLED BY AN IOT=SCOPE INSTRUCTION AT THE END
                                ;OF EACH TEST IN THE COMPREHENSIVE INSTRUCTION TEST AND COM-
                                ;BINED INSTRUCTION EXERCISER TEST SECTIONS OF THE PROGRAM.
                                ;IT IS DESIGNED TO IMPLEMENT THE CONSOLE SWITCH OPTIONS DEFINED
                                ;BELOW:

                                ;       SW14 = 1        LOOP ON CURRENT TEST

                                ;       SW11 = 1        INHIBIT SUB-TEST ITERATIONS

                                ;       SW10 = 1        LOOP ON TEST SELECTED BY SR<09:00>

065260  005137  066702         SCOPEA: COM     @#SCOFLG        ;THESE TWO ILSTRUCTIONS ARE
065264  000002                         RTI                     ;USED IN THE BASIC TESTS TO
                                                                ;VERIFY THE IOT LINKAGE

065266  112760  000377  070162 SCOPEB: MOVB    #377,STAB1(R0)  ;SET FLAG IN MISSED TEST TABLE
065274  032737  040000  177570         BIT     #SW14,@#SR      ;LOOP ON CURRENT TEST ?
065302  001403                         BEQ     2$              ;BR IF NO - SW14=0
065304  013716  066654         1$:     MOV     @#RETURN,(SP)   ;SET UP RTN PC ON STK TO LOOP
065310  000002                         RTI                     ;RETURN TO CURRENT TEST
065312  032737  002000  177570 2$:     BIT     #SW10,@#SR      ;LOOP ON SELECTED TEST ?
065320  001412                         BEQ     3$              ;BR IF NO - SW10=0
065322  013737  177570  066700         MOV     @#SR,@#SELTST   ;GET CONTENTS OF SWITCHES
065330  042737  176000  066700         BIC     #176000,@#SELTST;MASK OUT SR<15:10>
065336  020037  066700                 CMP     R0,@#SELTST     ;IS THIS THE SELECTED TEST ?
065342  001760                         BEQ     1$              ;BR IF YES
065344  000407                         BR      4$              ;GO EXIT TO NEXT TEST
065346  032737  004000  177570 3$:     BIT     #SW11,@#SR      ;INHIBIT ITERATIONS ?
065354  001003                         BNE     4$              ;BR IF YES - SW11=1
065356  005337  066664                 DEC     @#ITCNT         ;COUNT ONE TIME
065362  001350                         BNE     1$              ;BR IF NOT DONE - DO IT AGIN
065364  013737  066662  066664 4$:     MOV     @#ICOUNT,@#ITCNT ;RESET ITERATION COUNTER
065372  011637  066654                 MOV     (SP),@#RETURN   ;SET UP NEW SCOPE RETURN
065376  000002                         RTI                     ;RETURN TO DO NEXT SEQ. TEST
```

```
26590                           ; ****************************************************************
26591                                   .SBTTL ERROR SERVICE ROUTINE
26592                           ; ****************************************************************
26593
26594                           ;THIS UTILITY IS CALLED BY AN ERRORX = EMTX INSTRUCTION OF THE
26595                           ;FOLLOWING FORMAT:
26596
26597                           ;       E'N:    ERRORX
26598                           ;               R'N
26599
26600                           ;       WHERE: X REPRESENTS THE CODING OF THE LOW BYTE IN THE EMT
26601                           ;              AND INDICATES THE NO. OF COLUMNS TO BE PRINTED:
26602
26603                           ;                       X=0     ALL 8 COLUMNS
26604                           ;                         7     1ST SEVEN COLUMNS
26605                           ;                         6     1ST SIX COLUMNS
26606                           ;                         5     1ST FIVE COLUMNS
26607                           ;                         4     1ST FOUR COLUMNS
26608                           ;                         3     1ST THREE COLUMNS
26609                           ;                         2     1ST TWO COLUMNS
26610                           ;                         1     1ST COLUMN ONLY
26611
26612                           ;               R'N IS THE ADDRESS WHERE CONTROL IS RETURNED AFTER
26613                           ;               THE ERROR SERVICE IF SW09=1 (LOOP ON HARD ERROR).
26614                           ;               IF SWITCH 09 IS RESET CONTROL ISRETURNED TO
26615                           ;               E'N+4.
26616
26617                           ;IT IS DESIGNED TO SERVICE THE SWITCH OPTIONS DEFINED BELOW:
26618
26619                           ;               SW15=1  HALT ON ERROR - TESTED  AFTER
26620                           ;                       PRINTING - DEPRESSING CONTINUE RESUMES NORMAL
26621                           ;                       EXECUTION
26622
26623                           ;               SW13=1  INHIBIT ALL ERROR PRINTOUTS EXCEPT:
26624
26625                           ;                       1)BELL ON ERROR
26626                           ;                       2)FAULT #
26627                           ;                       3)INTRODUCTORY MESSAGE
26628                           ;                       4)ANY CATASTROPHIC ERROR MESSAGE
26629
26630
26631                           ;               SW09=1  LOCK ON HARD ERRORS
26632
26633                           ;THIS UTILITY ALSO CALLS THE OTA (OCTAL TO ASCII) AND TYPE (PRINT)
26634                           ;UTILITIES TO FORMAT AND REPORT THE ERRORS
26635
26636
26637  065400  005137  066676         ERRA:   COM     @#ERRFLG                ;THESE TWO INSTRUCTIONS ARE USED
26638  065404  000002                 RTI                             ;IN THE BASIC TESTS TO VERIFY THE EMT
26639
26640  065406  022737  177777  066666 ERRB:   CMP     #-1,@#ERRCNT    ;ERROR COUNT = 177777 ??
26641  065414  001402                 BEQ     1$              ;BR IF YES - FREEZE ERRCNT
26642  065416  005237  066666         INC     @#ERRCNT        ;COUNT THIS ERROR
26643  065422  010246                 1$:     MOV     R2,-(SP)        ;SAVE R2 ON THE STACK
26644  065424  016602  000002         MOV     2(SP),R2        ;GET THE PC+2 OF ERROR CALL
26645  065430  011237  066656         MOV     (R2),@#ERRTN    ;GET THE ERROR LOOP ADDRESS
```

```
26646  065434  014237  066640                  MOV     -(R2),@#COLCNT  ;GET THE ERROR EMT CALL
26647  065440  042737  177770  066640          BIC     #177770,@#COLCNT;MASK OUT BITS <15:03>
26648  065446  032737  020000  177570  3$:     BIT     #SW13,@#SR      ;INHIBIT ERROR PRINTOUT ?
26649  065454  001103                          BNE     6$              ;BR IF YES
26650  065456  005737  066716                  TST     @#ERFLG1        ;ERROR HEADER PRINTED FLAG SET ??
26651  065462  001006                          BNE     4$              ;BR IF IT IS-PRINTER HEADER ONCE PER PASS
26652  065464  104400                          TYPE                    ;CALL THE TYPE UTILITY
26653  065466  066732                          ERHDR1                  ;ADDR OF ERROR HEADER MSG 1
26654  065470  104400                          TYPE                    ;CALL THE TYPE UTILITY
26655  065472  067034                          ERHDR2                  ;ADDR OF ERROR HEADER MSG2
26656  065474  005137  066716                  COM     @#ERFLG1        ;FLAG THAT THE HEADER WAS PRINTED ONCE
26657  065500  104400                  4$:     TYPE                    ;START WITH A CR / LF
26658  065502  066726                          CRLF
26659  065504  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN ONE
26660  065510  022737  000001  066640          CMP     #1,@#COLCNT     ;WAS IT AN ERROR1 CALL ?
26661  065516  001460                          BEQ     5$              ;BR IF YES
26662
26663  065520  016602  000004                  MOV     4(SP),R2        ;GET THE ERROR PSW
26664  065524  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN TWO
26665  065530  022737  000002  066640          CMP     #2,@#COLCNT     ;WAS IT AN ERROR2 CALL ?
26666  065536  001450                          BEQ     5$              ;BR IF YES
26667
26668  065540  010602                          MOV     SP,R2           ;GET THE CONTENTS OF THE SP
26669  065542  005722                          TST     (R2)+           ;CORRECT IT
26670  065544  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 3
26671  065550  022737  000003  066640          CMP     #3,@#COLCNT     ;WAS IT AN ERROR3 CALL ?
26672  065556  001440                          BEQ     5$              ;BR IF YES
26673
26674  065560  010002                          MOV     R0,R2           ;GET THE TEST # IN R0
26675  065562  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 4
26676  065566  022737  000004  066640          CMP     #4,@#COLCNT     ;WAS IT AN ERROR4 CALL ?
26677  065574  001431                          BEQ     5$              ;BR IF YES
26678
26679  065576  010102                          MOV     R1,R2           ;GET THE COPY OF THE INSTRUCTION
26680  065600  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 5
26681  065604  022737  000005  066640          CMP     #5,@#COLCNT     ;WAS IT AN ERROR5 CALL ?
26682  065612  001422                          BEQ     5$              ;BR IF YES
26683
26684  065614  012602                          MOV     (SP)+,R2        ;GET THE ORIGINAL R2 OFF STACK
26685  065616  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 6
26686  065622  010246                          MOV     R2,-(SP)        ;MAINTAIN COMPATABILITY
26687  065624  022737  000006  066640          CMP     #6,@#COLCNT     ;WAS IT AN ERROR6 CALL ?
26688  065632  001412                          BEQ     5$              ;BR IF YES
26689
26690  065634  010302                          MOV     R3,R2           ;GET THE CONTENTS OF R3
26691  065636  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 7
26692  065642  022737  000007  066640          CMP     #7,@#COLCNT     ;WAS IT AN ERROR7 CALL ?
26693  065650  001403                          BEQ     5$              ;BR IF YES
26694
26695  065652  010402                          MOV     R4,R2           ;GET THE CONTENTS OF R4
26696  065654  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 8
26697  065660  104400                  5$:     TYPE                    ;CALL THE TYPE UTILITY
26698  065662  066726                          CRLF                    ;ADDRESS OF THE CR / LF MESSAGE
26699  065664  012602                  6$:     MOV     (SP)+,R2        ;RESTORE THE INTEGRITY OF R2
26700  065666  032737  002000  177570          BIT     #SW10,@#SR      ;LOOP ON SELECTED TEST ???
26701  065674  001012                          BNE     7$              ;BR IF YES - SW09 PART OF TEST NO.
```

```
26702  065676  032737  001000  177570          BIT     #SW09,@#SR      ;LOOP ON HARD ERRORS ???
26703  065704  001406                          BEQ     7$              ;BR IF NOT - REWARD TO THE FIRST
26704                                                                  ;MAINTENANCE MAN WHO CALLS THE
26705                                                                  ;AUTHOR OF THIS PROGRAM IN
26706                                                                  ;MARLBORO,MASS.
26707  065706  013716  066656                  MOV     @#ERRTN,(SP)    ;PUT ERROR RETURN ADDR ON STACK
26708  065712  042766  000020  000002          BIC     #20,2(SP)       ;CLEAR "T" BIT ON THE STACK IN CASE
26709                                                                  ;THIS ERROR OCCURRED IN "T" BIT TESTS
26710  065720  000002                          RTI                     ;RETURN TO LOOP ON THIS ERROR CALL
26711  065722  005737  177570          7$:     TST     @#SR            ;HALT AFTER PRINTING ???
26712  065726  100001                          BPL     .+4             ;BR IF NOT
26713  065730  000000                          HALT                    ;DEPRESS CONTINUE TO RESUME TEST
26714                                                                  ;AFTER THE HALT THE ADDRESS DISPLAY
26715                                                                  ;CONTAINS #(7$+10) AND THE DATA DISP-
26716                                                                  ;LAY CONTAINS THE NUMBER OF THE FAIL-
26717                                                                  ;ING TEST
26718  065732  062716  000002                  ADD     #2,(SP)         ;MOVE RETURN PC AROUND RN
26719  065736  042766  000020  000002          BIC     #20,2(SP)       ;CLEAR "T" BIT ON STACK IN CASE THIS
26720                                                                  ;ERROR OCCURRED IN "T" BIT TESTS
26721  065744  000002                          RTI                     ;RETURN TO INSTRUCTION AFTER ERROR
26722
26723                                          ;CONVERSION AND OUTPUT CALLS
26724
26725  065746  004737  065760          8$:     JSR     PC,@#OTA                ;CONVERT [R2] TO SIX ASCII CHARS.
26726  065752  104400                          TYPE                    ;CALL THE TYPE UTILITY
26727  065754  067136                          DIGITS                  ;ADDRESS OF THE ASCII BUFFER
26728  065756  000207                          RTS     PC              ;RETURN TO CALLER ABOVE
26729
26730
26731
```

```
                                ; ************************************************************************
                                        .SBTTL OCTAL TO ASCII CONVERSION ROUTINE
                                ; ************************************************************************

                                ;THIS ROUTINE CONVERTS THE 16 BIT OCTAL NUMBER IN R2 TO ITS 6 CHAR.
                                ;ASCII EQUIVALENT AND STORES THE CHARACTERS IN AN EIGHT CHAR. BUFFER
                                ;THAT STARTS AT THE ADDRESS TAGGED "DIGITS" - THE 7TH AND 8TH CHAR.
                                ;POSITIONS ARE LOADED WITH A SPACE CHAR. FOLLOWED BY A ZERO TERMINATOR
                                ;BYTE - THE ROUTINE IS CALLED VIA A "JSR  PC,OTA"

065760  004737  066146          OTA:    JSR     PC,@#SAVR               ;GO SAVE THE REGISTERS R0 THRU R5
065764  012704  067136                  MOV     #DIGITS,R4      ;SET UP R4 TO POINT TO ASCII BUFFER
065770  005003                          CLR     R3              ;INITIALIZE R3 FOR USE AS INDEX REG.
                                                                ;TO ASCII CONVERSION TABLE
065772  010201                          MOV     R2,R1           ;SAVE ORIGINAL NUMBER IN R1
065774  006302                  1$:     ASL     R2              ;MOST SIGNIFICANT BIT GOES INTO "C"
065776  006103                          ROL     R3              ;R3 CONTAINS THE MOST SIGNIFICANT BIT
066000  012700  000006                  MOV     #6,R0           ;COUNT SIX DIGITS CONVERSION
066004  000404                          BR      3$              ;CONVERT AND LOAD THE 1ST DIGIT
066006  006302                  2$:     ASL     R2              ;SHIFT BITS OUT OF R2 INTO "C"
066010  006103                          ROL     R3              ;SHIFT "C" INTO THE LSB POS. OF R3
066012  005301                          DEC     R1              ;COUNT ONE BIT SHIFTED
066014  001374                          BNE     2$              ;BR UNTIL 3 BITS SHIFTED
066016  012701  000003          3$:     MOV     #3,R1           ;INITIALIZE BIT SHIFT COUNTER
066022  116324  066644                  MOVB    DIGTAB(R3),(R4)+;MOVE CHAR. TO DIGIT BUFFER
066026  005003                          CLR     R3              ;CLEAR INDEX TO CONVERSION TABLE
066030  005300                          DEC     R0              ;COUNT ONE CHAR.
066032  001365                          BNE     2$              ;BR UNTIL 6 CHARS CONVERTED
066034  004737  066166                  JSR     PC,@#RESTR      ;GO RESTORE THE REGS
066040  000207                          RTS     PC              ;RETURN TO CALLER
```

```
26768                                   ; ***************************************************************************
26769                                          .SBTTL PRINT SUBROUTINE
26770                                   ; ***************************************************************************
26771
26772                                   ;THIS ROUTINE IS CALLED TO PRINT ALL ASCII MESSAGES - IT IS CALLED VIA
26773                                   ;A TYPE = TRAP = 104400 INSTRUCTION AS SHOWN BELOW:
26774
26775                                           ;TYPE
26776                                           ;ADDP
26777
26778                                           ;WHERE "ADDR" IS THE STARTING ADDRESS OF THE MESSAGE BUFFER
26779                                           ;TO BE PRINTED - THE SUBROUTINE WILL CONTINUE TO PRINT CHAR-
26780                                           ;ACTERS UNTIL IT FINDS A "000" BYTE TERMINATOR
26781
26782                                   ;IF FILLER CHARACTERS ARE REQUIRED THE LOCATION TAGGED "FILLS" MUST
26783                                   ;CONTAIN THE FOLLOWING INFORMATION:
26784
26785                                           ;FILLS - ODD BYTE = NO. OF FILLERS REQUIRED
26786                                           ;FILLS - EVEN BYTE = FILLER CHARACTER DESIRED
26787
26788                                           ;THE DEFAULT VALUE OF FILLS IS 0,0
26789
26790  066042  005137  066674        PRINA:  COM     @#PRIFLG                ;THESE TWO INSTRUCTIONS ARE
26791  066046  000002                        RTI                             ;USED BY THE BASIC TESTS TO VERIFY
26792                                                                         ;THE TRAP INSTRUCTION
26793
26794  066050  010046                PRINT:  MOV     R0,-(SP)                ;SAVE R0 ON THE STACK
26795  066052  017600  000002                MOV     @2(SP),R0               ;SET R0 TO POINT TO THE MESSAGE BUFFER
26796  066056  062766  000002  000002        ADD     #2,2(SP)                ;ADJUST THE RETURN PC TO POINT TO THE
26797                                                                         ;INSTRUCTION FOLLOWING THE CALL
26798  066064  112046                1$:     MOVB    (R0)+,-(SP)             ;PUSH CHAR. TO BE TYPED ON THE STACK
26799                                                                         ;AND UPDATE THE BUFFER POINTER
26800  066066  001003                        BNE     2$                      ;BRANCH IF NOT A 000 TERMINATOR
26801  066070  005726                        TST     (SP)+                   ;POP TERMINATOR OFF THE STACK
26802  066072  012600                        MOV     (SP)+,R0                ;RESTORE THE ORIGINAL R0
26803  066074  000002                        RTI                             ;RETURN TO CALLER
26804  066076  004737  066130        2$:     JSR     PC,@#5$                 ;GO TYPE THE CHARACTER
26805  066102  122726  000012        3$:     CMPB    #12,(SP)+               ;WAS CHAR TYPED A LINE FEED ?
26806  066106  001366                        BNE     1$                      ;BRANCH IF NOT
26807  066110  013746  066660                MOV     @#FILLS,-(SP)           ;GET THE FILLER COUNT AND CHARACTER
26808  066114  105366  000001        4$:     DECB    1(SP)                   ;COUNT ONE FILLER OUT
26809  066120  002770                        BLT     3$                      ;BR IF NO MORE FILLERS NEEDED
26810  066122  004737  066130                JSR     PC,@#5$                 ;GO TYPE THE FILLER
26811  066126  000772                        BR      4$                      ;GO COUNT AND TEST FILLER COUNT
26812
26813  066130  105737  177564        5$:     TSTB    @#XCSR                  ;OUTPUT DEVICE READY
26814  066134  100375                        BPL     5$                      ;BRANCH BACK IF NOT READY - NOTE THE
26815                                                                         ;PROGRAM WILL HANG HERE IN THE EVENT THAT
26816                                                                         ;THE DL11 READY LOGIC FAILS DURING RUN
26817  066136  116637  000002  177566        MOVB    2(SP),@#XDBR            ;OUTPUT THE CHARACTER
26818  066144  000207                        RTS     PC                      ;RETURN TO CALLER
```

```
                                ; ************************************************************************
                                ;       .SBTTL SAVE REGISTER SUBROUTINE
                                ; ************************************************************************

                                ;THIS ROUTINE IS CALLED BY THE "OTA" UTILITY AND WILL SAVE GENERAL
                                ;REGISTERS R0 THRU R5 ON THE PROCESSOR STACK

066146  010546                  SAVR:   MOV     R5,-(SP)        ;PUSH R5 ON THE STACK
066150  010446                          MOV     R4,-(SP)        ;PUSH R4
066152  010346                          MOV     R3,-(SP)        ;PUSH R3
066154  010246                          MOV     R2,-(SP)        ;PUSH R2
066156  010146                          MOV     R1,-(SP)        ;PUSH R1
066160  010046                          MOV     R0,-(SP)        ;PUSH R0
066162  016607  000014                  MOV     14(SP),PC       ;RETURN TO THE INSTRUCTION THAT
                                                                ;FOLLOWS THE "JSR PC,SAVR" CALL
```

```
                                ; ************************************************************************
                                        .SBTTL RESTORE REGISTERS SUB-ROUTINE
                                ; ************************************************************************

                                ;THIS ROUTINE COMPLEMENTS THE SAVE REGISTER ROUTINE AND WILL RESTORE
                                ;GENERAL REGISTERS R0 THRU R5 FROM THE STACK - IT IS CALLED VIA A
                                ;JSR     PC,RESTR.

066166  012666  000014          RESTR:  MOV     (SP)+,14(SP)    ;REPOSITION THE RETURN PC ON THE STACK
066172  012600                          MOV     (SP)+,R0        ;RESTORE R0 - R5
066174  012601                          MOV     (SP)+,R1
066176  012602                          MOV     (SP)+,R2
066200  012603                          MOV     (SP)+,R3
066202  012604                          MOV     (SP)+,R4
066204  012605                          MOV     (SP)+,R5
066206  000207                          RTS     PC              ;RETURN TO THE INSTRUCTION THAT
                                                                ;FOLLOWS THE "JSR RESTR" CALL
```

```
26854                                   ; ***************************************************************************
26855                                          .SBTTL ROUTINES TO CHECK FOR AND FLAG 11/40 OPTIONS
26856                                   ; ***************************************************************************
26857
26858  066210  005737  066670          TSTOPT: TST     @#PASCNT        ;1ST PASS ??
26859  066214  001027                          BNE     1$              ;BR IF NOT
26860  066216  005037  066636                  CLR     @#OPTION        ;CLEAR THE OPTION FLAG WORD
26861  066222  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ??
26862  066230  001002                          BNE     .+6             ;BR IF YES
26863  066232  104400                          TYPE                    ;TYPE OPTIONS AVAIL. HEADER
26864  066234  067270                          OPT1
26865  066236  004737  066276                  JSR     PC,@#CHKKT      ;GO TEST FOR KT11-D OPTION
26866  066242  004737  066352                  JSR     PC,@#CHKKJ      ;GO TEST FOR KJ11-A OPTION
26867  066246  004737  066426                  JSR     PC,@#CHKKF      ;GO TEST FOR KE11-F OPTION
26868  066252  004737  066504                  JSR     PC,@#CHKKE      ;GO TEST FOR KE11-E OPTION
26869  066256  004737  066562                  JSR     PC,@#CHKKW      ;GO TEST FOR KW11-L OPTION
26870  066262  005737  066636                  TST     @#OPTION        ;ANY OPTIONS FOUND
26871  066266  001002                          BNE     1$              ;BR IF YES
26872  066270  104400                          TYPE                    ;GO TYPE "NONE"
26873  066272  067423                          OPT7
26874  066274  000207                  1$:     RTS     PC              ;RETURN TO "CIT" START-UP
26875
26876  066276  013704  000004          CHKKT:  MOV     @#4,R4          ;SAVE THE TIMEOUT VECTOR
26877  066302  012737  066340  000004          MOV     #1$,@#4         ;GO TO 1$ IF TRAP OCCURS
26878  066310  005737  177572                  TST     @#177572        ;REFERENCE KT11 SRO
26879  066314  052737  000200  066636          BIS     #200,@#OPTION   ;SET BIT7 IF KT IS THERE
26880  066322  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
26881  066330  001002                          BNE     .+6             ;BR IF YES
26882  066332  104400                          TYPE                    ;GO TYPE "KT11-D"
26883  066334  067334                          OPT2
26884  066336  000402                          BR      2$
26885  066340  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
26886  066344  010437  000004          2$:     MOV     R4,@#4          ;RESTORE THE TIMEOUT VECTOR
26887  066350  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE
26888
26889  066352  013704  000004          CHKKJ:  MOV     @#4,R4          ;SAVE THE TIMEOUT VECTOR
26890  066356  012737  066414  000004          MOV     #1$,@#4         ;GO TO 1$ IF TRAP OCCURS
26891  066364  005737  177774                  TST     @#177774        ;REFERENCE KJ11 REG.
26892  066370  052737  000004  066636          BIS     #4,@#OPTION     ;SET BIT2 IF KJ IS THERE
26893  066376  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
26894  066404  001002                          BNE     .+6             ;BR IF YES
26895  066406  104400                          TYPE                    ;GO TYPE "KJ11-A"
26896  066410  067347                          OPT3
26897  066412  000402                          BR      2$
26898  066414  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
26899  066420  010437  000004          2$:     MOV     R4,@#4          ;RESTORE THE TIMEOUT VECTOR
26900  066424  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE
26901
26902  066426  013704  000010          CHKKF:  MOV     @#10,R4         ;SAVE THE RSVD INSTR VECTOR
26903  066432  012737  066472  000010          MOV     #1$,@#10        ;GO TO 1$ IF TRAP OCCURS
26904  066440  012702  067602                  MOV     #MBUF0,R2       ;SET UP FOR FADD TRY
26905  066444  075002                          FADD    R2              ;TEST FOR THE KE11-F OPTION
26906  066446  052737  000002  066636          BIS     #2,@#OPTION     ;SET BIT1 IF IT RESPONDS
26907  066454  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
26908  066462  001002                          BNE     .+6             ;BR IF YES
26909  066464  104400                          TYPE                    ;GO TYPE "KE11-F"
```

```
26910  066466  067362                          OPT4
26911  066470  000402                          BR      2$
26912  066472  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
26913  066476  010437  000010          2$:     MOV     R4,@#10         ;RESTORE THE RSVD INSTR VECTOR
26914  066502  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE
26915
26916  066504  013704  000010          CHKKE:  MOV     @#10,R4         ;SAVE THE RSVD INSTR VECTOR
26917  066510  012737  066550  000010          MOV     #1$,@#10        ;GO TO 1$ IF TRAP OCCURS
26918  066516  005001                          CLR     R1              ;SET UP TO TRY ASH INSTR.
26919  066520  005002                          CLR     R2
26920  066522  072201                          ASH     R1,R2           ;TRY A KE INSTR
26921  066524  052737  000001  066636          BIS     #1,@#OPTION     ;SET BIT0 IF KE IS THERE
26922  066532  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
26923  066540  001002                          BNE     .+6             ;BR IF YES
26924  066542  104400                          TYPE                    ;GO TYPE "KE11-E"
26925  066544  067375                          OPT5
26926  066546  000402                          BR      2$
26927  066550  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
26928  066554  010437  000010          2$:     MOV     R4,@#10         ;RESTORE THE RSVD INSTR VECTOR
26929  066560  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE
26930
26931  066562  013704  000004          CHKKW:  MOV     @#4,R4          ;SAVE THE TIMEOUT VECTOR
26932  066566  012737  066624  000004          MOV     #1$,@#4         ;GO TO 1$ IF TRAP OCCURS
26933  066574  005737  177546                  TST     @#177546        ;REFERENCE KW11-L CSR
26934  066600  052737  100000  066636          BIS     #100000,@#OPTION;SET BIT15 IF KW IS THERE
26935  066606  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
26936  066614  001002                          BNE     .+6             ;BR IF YES
26937  066616  104400                          TYPE                    ;GO TYPE "KW11-L"
26938  066620  067410                          OPT6
26939  066622  000402                          BR      2$
26940  066624  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
26941  066630  010437  000004          2$:     MOV     R4,@#4          ;RESTORE THE TIMEOUT VECTOR
26942  066634  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE
26943
```

```
26944                                   ;FLAGS, CONSTANTS, AND VARIABLES
26945
26946  066636  000000                   OPTION: 0                       ;SET UP ON ENTRY TO "CIT" SECTION TO
26947                                                                   ;SPECIFY OPTIONS INSTALLED:
26948                                                                   ;BIT15=1 KW11-L INSTALLED
26949                                                                   ;BIT07=1 KT11-D INSTALLED
26950                                                                   ;BIT02=1 KJ11-A INSTALLED
26951                                                                   ;BIT01=1 KE11-F INSTALLED
26952                                                                   ;BIT00=1 KE11-E INSTALLED
26953  066640  000000                   COLCNT: 0                       ;USED BY ERROR SERVICE TO STORE COLUMN COUNT
26954  066642  000000                   BPTLOC: 0                       ;STORES 16 USER DEFINED MAINTENANCE
26955                                                                   ;BREAKPOINTS
26956  066644  030460                   DIGTAB: "01                     ;OCTAL TO ASCII CONVERSION TABLE
26957  066646  031462                           "23
26958  066650  032464                           "45
26959  066652  033466                           "67
26960  066654  000000                   RETURN: 0                       ;USED BY SCOPE TO STORE RETURN ADDRESS
26961  066656  000000                   ERRTN:  0                       ;USED BY ERROR SERV. TO STORE ERROR RETURN ADDR.
26962  066660  002400                   FILLS:  02400                   ;STORES FILL CHAR AND FILL COUNT
26963  066662  000001                   ICOUNT: 1                       ;ITERATION COUNTERS
26964  066664  000001                   ITCNT:  1
26965  066666  000000                   ERRCNT: 0                       ;STORES TOTAL ERROR COUNT
26966  066670  000000                   PASCNT: 0                       ;STORES TOTAL NO. OF PASSES
26967  066672  000000                   PFCNT:  0                       ;KEEPS COUNT OF # OF PWRFAILS
26968  066674  000000                   PRIFLG: 0                       ;FLAG USED BY BASIC TESTS FOR TRAP TEST
26969  066676  000000                   ERRFLG: 0                       ;FLAG USED BY BASIC TESTS FOR EMT TEST
26970  066700  000000                   SELTST: 0                       ;STORES SR<8:0> FOR LOOP ON SELECTED TEST
26971  066702  000000                   SCOFLG: 0                       ;USED BY BASIC TESTS FOR IOT TEST
26972  066704  000000                   FIRST:  0                       ;CONTAINS FIRST TEST # LOGGED IN MISSED TEST TABLE
26973  066706  000000                   LAST:   0                       ;CONTAINS LAST TEST # LOGGED IN MISSED TEST TABLE
26974  066710  000000                   MISFLG: 0                       ;FLAGS MISSED TEST ERROR HEADER PRINTED
26975  066712  000000                   RSVFLG: 0                       ;FLAG USED BY BASIC TEST OF RSVD INSTR TRAP
26976  066714  000000                   BERFLG: 0                       ;FLAG USED BY BASIC TEST OF BUS ERROR TRAPS
26977  066716  000000                   ERFLG1: 0                       ;ALLOWS ONLY 1 ERROR HEADER PER PASS
26978  066720  000000                   CATERR: 0                       ;FLAGS USED BY BUS ERROR AND RSVD INSTR TRAP
26979                                                                   ;SERVICE ROUTINES
26980  066722  000000                   ONCE:   0                       ;FLAGS PROGRAM TITLE HAS BEEN PRINTED
```

```
26981                                          ;MESSAGE TABLES
26982
26983                                          .EVEN
26984  066724  000007                         BELL:   7
26985  066726  005015                         CRLF:   5015
26986  066730  000000                                 0
26987  066732                                 ERHDR1:
26988  066732  005015  024040  041520         .ASCIZ  <15><12>  (PC)    (PS)    (SP)    TEST    (IR)    DEST    WAS     S / B '
26989  066740  020051  020040  024040
26990  066746  051520  020051  020040
26991  066754  024040  050123  020051
26992  066762  020040  052040  051505
26993  066770  020124  020040  024040
26994  066776  051111  020051  020040
26995  067004  042040  051505  020124
26996  067012  020040  053440  051501
26997  067020  020040  020040  051440
26998  067026  027440  041040  000040
26999  067034                                 ERHDR2:
27000  067034  005015  024040  033522         .ASCIZ <15><12>' (R7)    (PSW)   (R6)    (R0)    (R1)    (R2)    (R3)    (R4)'<15><12>
27001  067042  020051  020040  024040
27002  067050  051520  024527  020040
27003  067056  024040  033122  020051
27004  067064  020040  024040  030122
27005  067072  020051  020040  024040
27006  067100  030522  020051  020040
27007  067106  024040  031122  020051
27008  067114  020040  024040  031522
27009  067122  020051  020040  024040
27010  067130  032122  006451  000012
27011  067136  030060  030060  030060  DIGITS: .ASCIZ  '000000  '
27012  067144  020040     000
27013  067147     015  050012  051501  EOP1:   .ASCIZ  <15><12>'PASCNT = '
27014  067154  047103  020124  020075
27015  067162     000
27016  067163     040  050040  041506  PFMESS: .ASCIZ  '  PFCNT = '
27017  067170  052116  036440  000040
27018  067176  020040  051105  041522  EOP2:   .ASCIZ '  ERRCNT = '
27019  067204  052116  036440  000040
27020  067212  005015  041104  042521  IDENT1: .ASCIZ <15><12>'DBQEA-B   KD11-A DIAGNOSTIC   VERSION 001'<15><12>
27021  067220  026501  020102  020040
27022  067226  042113  030461  040455
27023  067234  042040  040511  047107
27024  067242  051517  044524  020103
27025  067250  020040  042526  051522
27026  067256  047511  020116  030060
27027  067264  006461  000012
27028  067270  005015  042120  030520  OPT1:   .ASCIZ  <15><12>'PDP11/40 INTERNAL OPTIONS FOUND'<15><12>
27029  067276  027461  030064  044440
27030  067304  052116  051105  040516
27031  067312  020114  050117  044524
27032  067320  047117  020123  047506
27033  067326  047125  006504  000012
27034  067334  005015  052113  030461  OPT2:   .ASCIZ  <15><12>'KT11-D'<15><12>
27035  067342  042055  005015     000
27036  067347     015  045412  030512  OPT3:   .ASCIZ  <15><12>'KJ11-A'<15><12>
```

```
27037  067354  026461  006501  000012
27038  067362  005015  042513  030461  OPT4:   .ASCIZ  <15><12>'KE11-F'<15><12>
27039  067370  043055  005015     000
27040  067375     015  045412  030505  OPT5:   .ASCIZ  <15><12>'KE11-E'<15><12>
27041  067402  026461  006505  000012
27042  067410  005015  053513  030461  OPT6:   .ASCIZ  <15><12>'KW11-L'<15><12>
27043  067416  046055  005015     000
27044  067423     015  047012  047117  OPT7:   .ASCIZ  <15><12>'NONE FOUND'
27045  067430  020105  047506  047125
27046  067436  000104
27047  067440  005015  047520  042527  PFMSG:  .ASCIZ <15><12>'POWER' <15><12>
27048  067446  006522  000012
27049  067452  005015  051124  050101  BEMSG:  .ASCIZ <15><12>'TRAPPED TO 4 PC = '
27050  067460  042520  020104  047524
27051  067466  032040  050040  020103
27052  067474  020075     000
27053  067477     015  046412  051511  MISHDR: .ASCIZ <15><12>'MISSED TESTS'<15><12>
27054  067504  042523  020104  042524
27055  067512  052123  006523  000012
27056  067520  005015  051124  050101  RSMSG:  .ASCIZ <15><12>'TRAPPED TO 10 PC = '
27057  067526  042520  020104  047524
27058  067534  030440  020060  041520
27059  067542  036440  000040
27060                                  .EVEN
```

```
27061                                   ;COMMON DATA STRUCTURES AND MISCELLANEOUS TABLES
27062
27063  067546  177400          OBUF:    177400                  ;DL11 OUTPUT TEST BUFFER
27064  067550  177400                   177400
27065  067552  177400                   177400
27066  067554  177400                   177400
27067
27068  067556  000004          IBUF:    .BLKW   4               ;DL11 INPUT TEST BUFFER
27069
27070  067566  067612          ATA:     DWTA
27071  067570  070136                   DWTB
27072  067572  070152                   DBTA
27073  067574  070156                   DBTB
27074  067576  067602                   MBUF0
27075  067600  067606                   MBUF1
27076
27077  067602  000000          MBUF0:   0
27078  067604  000000                   0
27079  067606  000000          MBUF1:   0
27080  067610  000000                   0
27081  067612  000000          DWTA:    0
27082  067614  177777                   -1
27083  067616  177400                   177400
27084  067620  000377                   377
27085  067622  125252                   125252
27086  067624  052525                   052525
27087
27088                                   ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU ADD TEST IN THE
27089                                   ;COMBINED INSTRUCTION TESTS
27090
27091  067626  000000          ALUADD:  000000                  ;NULL
27092  067630  000000                   000000                  ;SRC OP1
27093  067632  000000                   000000                  ;DST OP1
27094  067634  000000                   000000                  ;ANS1
27095  067636  177777                   177777                  ;SRC OP2
27096  067640  177777                   177777                  ;DST OP2
27097  067642  177776                   177776                  ;ANS2
27098  067644  125252                   125252                  ;SRC OP3
27099  067646  052525                   052525                  ;DST OP3
27100  067650  177777                   177777                  ;ANS3
27101  067652  052525                   052525                  ;SRC OP4
27102  067654  125252                   125252                  ;DST OP4
27103  067656  177777                   177777                  ;ANS4
27104  067660  125252                   125252                  ;SRC OP5
27105  067662  125252                   125252                  ;DST OP5
27106  067664  052524                   052524                  ;ANS5
27107  067666  052525                   052525                  ;SRC OP6
27108  067670  052525                   052525                  ;DST OP6
27109  067672  125252                   125252                  ;ANS6
27110  067674  052525                   052525                  ;SRC OP7
27111  067676  125253                   125253                  ;DST OP7
27112  067700  000000                   000000                  ;ANS7
27113  067702  125253                   125253                  ;SRC OP8
27114  067704  052525                   052525                  ;DST OP8
27115  067706  000000                   000000                  ;ANS8
27116
```

```
27117
27118                                   ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU "AND" TESTS IN THE
27119                                   ;COMBINED INSTRUCTION EXERCISER TESTS
27120
27121  067710  000000             ANDTAB: 000000                  ;NULL ENTRY
27122  067712  000000                     000000                  ;SRC OP1
27123  067714  000000                     000000                  ;DEST OP1
27124  067716  000000                     000000                  ;ANS1
27125  067720  177777                     177777                  ;SRC OP2
27126  067722  177777                     177777                  ;DST OP2
27127  067724  000000                     000000                  ;ANS2
27128  067726  000000                     000000                  ;SRC OP3
27129  067730  177777                     177777                  ;DST OP3
27130  067732  177777                     177777                  ;ANS3
27131  067734  177777                     177777                  ;SRC OP4
27132  067736  000000                     000000                  ;DST OP4
27133  067740  000000                     000000                  ;ANS4
27134  067742  125252                     125252                  ;SRC OP5
27135  067744  125252                     125252                  ;DST OP5
27136  067746  000000                     000000                  ;ANS5
27137  067750  052525                     052525                  ;SRC OP6
27138  067752  052525                     052525                  ;DST OP6
27139  067754  000000                     000000                  ;ANS6
27140  067756  125252                     125252                  ;SRC OP7
27141  067760  052525                     052525                  ;DST OP7
27142  067762  052525                     052525                  ;ANS7
27143  067764  052525                     052525                  ;SRC OP8
27144  067766  125252                     125252                  ;DST OP8
27145  067770  125252                     125252                  ;ANS8
27146
27147                                   ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU "OR" TEST IN THE
27148                                   ;COMBINED INSTRUCTION EXERCISER TEST
27149
27150  067772  000000             ORTAB:  000000                  ;NULL ENTRY
27151  067774  000000                     000000                  ;SRC OP1
27152  067776  000000                     000000                  ;DEST OP1
27153  070000  000000                     000000                  ;ANS1
27154  070002  177777                     177777                  ;SRC OP2
27155  070004  177777                     177777                  ;DST OP2
27156  070006  177777                     177777                  ;ANS2
27157  070010  000000                     000000                  ;SRC OP3
27158  070012  177777                     177777                  ;DST OP3
27159  070014  177777                     177777                  ;ANS3
27160  070016  177777                     177777                  ;SRC OP4
27161  070020  000000                     000000                  ;DST OP4
27162  070022  177777                     177777                  ;ANS4
27163  070024  125252                     125252                  ;SRC OP5
27164  070026  125252                     125252                  ;DST OP5
27165  070030  125252                     125252                  ;ANS5
27166  070032  052525                     052525                  ;SRC OP6
27167  070034  052525                     052525                  ;DST OP6
27168  070036  052525                     052525                  ;ANS6
27169  070040  125252                     125252                  ;SRC OP7
27170  070042  052525                     052525                  ;DST OP7
27171  070044  177777                     177777                  ;ANS7
27172  070046  052525                     052525                  ;SRC OP8
```

```
27173  070050  125252                          125252                  ;DST OP8
27174  070052  177777                          177777                  ;ANS8
27175
27176
27177                                  ;THIS TABLE OF 8 ENTRIES IS USED BYTHE ALU SUB TEST IN THE
27178                                  ;COMBINED INSTRUCTION EXERCISER TESTS
27179
27180  070054  000000                  ALUSUB: 000000                  ;NULL
27181  070056  000000                          000000                  ;SRC OP1
27182  070060  000000                          000000                  ;DST OP1
27183  070062  000000                          000000                  ;ANS1
27184  070064  177777                          177777                  ;SRC OP2
27185  070066  177777                          177777                  ;DST OP2
27186  070070  000000                          000000                  ;ANS2
27187  070072  125252                          125252                  ;SRC OP3
27188  070074  052525                          052525                  ;DST OP3
27189  070076  125253                          125253                  ;ANS3
27190  070100  052525                          052525                  ;SRC OP4
27191  070102  125252                          125252                  ;DST OP4
27192  070104  052525                          052525                  ;ANS4
27193  070106  125252                          125252                  ;SRC OP5
27194  070110  125252                          125252                  ;DST OP5
27195  070112  000000                          000000                  ;ANS5
27196  070114  052525                          052525                  ;SRC OP6
27197  070116  052525                          052525                  ;DST OP6
27198  070120  000000                          000000                  ;ANS6
27199  070122  052525                          052525                  ;SRC OP7
27200  070124  125253                          125253                  ;DST OP7
27201  070126  052526                          052526                  ;ANS7
27202  070130  125253                          125253                  ;SRC OP8
27203  070132  052525                          052525                  ;DST OP8
27204  070134  125252                          125252                  ;ANS8
27205
27206  070136  000000                  DWTB:   0
27207  070140  000001                          1
27208  070142  000400                          400
27209  070144  177401                          177401
27210  070146  052526                          52526
27211  070150  125253                          125253
27212                                  .EVEN
27213  070152                          DBTA:
27214  070152      000  377    252     .BYTE   000,377,252,125
27215  070155      125
27216  070156                          DBTB:
27217  070156      000  001    120     .BYTE   000,001,120,253
27218  070161      253
27219  070162  001022                  STAB1:  .BLKB   530.            ;RESERVE 530. BYTE TABLE FOR
27220                                                                  ;LOGGING ANY MISSED TESTS
27221  071204  000000                  STAB2:  0
27222
27223           000001                  .END
```

D8QEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
ALUADD  067626          25914   25916   27091#
ALUSUB  070054          25983   25985   27180#
ANDTAB  067710          26056   26058   27121#
ATA     067566           5387    5487    5499    5530    5593    5624    5704    5741    5776    5789    5816    5828    5856
                        14183   14195   14228   14240   14270   14283   14313   14325   14355   14368   14398   14434   14471
                        14508   14545   14591   14637   14638   14653   14683   14684   14699   14729   14775   14821   14822
                        14837   14867   14868   14883   14914   14953   14992   15031   16078   16091   16164   16177   16246
                        16700   16715   16756   16771   16810   16826   16866   16882   17142   17157   17198   17213   17252
                        17268   1730E   17324   17565   17618   17667   17717   17839   17914   18324   18329   18415   18420
                        18499   18614   20474   20551   20629   27070#
A0012   003354           4451    4456#
A0013   003414           4488    4493#
A002    001006           2998#   3002
A0021   003764           4707    4711#
A0022   004034           4746    4751#
A0023   004102           4785    4790#
A0024   004154           4823    4828#
A0032   004526           5040    5045#
A0033   004576           5078    5083#
A0034   004646           5115    5120#
A0035   004716           5153    5158#
A0036   004762           5190    5195#
A0037   005036           5229    5234#
A0040   005122           5271    5276#
A0041   005174           5310    5315#
A0042   005262           5352    5360#
A0046   005512           5494    5499#
A0050   005622           5561    5566#
A0053   006004           5665    5671#
A0054   006064           5707    5713#
A0056   006214           5783    5789#
A0057   006272           5823    5828#
A0062   006502           5934    5940#
A0063   006556           5975    5980#
A0072   007176           6221    6227#
A0074   007302           6289    6294#
A0077   007514           6405    6411#
A0100   007600           6452    6457#
A0101   007704           6506    6511#
A0102   010010           6560    6565#
A0103   010112           6614    6619#
A0104   010230           6671    6677#
A0105   010320           6714    6720#
A0106   010410           6757    6763#
A0107   010500           6799    6805#
A0110   010566           6841    6847#
A0111   010654           6884    6890#
A0112   010744           6926    6932#
A0113   011034           6969    6975#
A0114   011112           7011    7016#
A0115   011170           7052    7057#
A0116   011256           7096    7101#
A0117   011356           7151    7156#
A0124   011704           7331    7339#
A0125   011744           7369    7374#
A0126   012020           7403    7412#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
A0127   012110            7449    7455#
A0130   012206            7486    7497#
A0131   012334            7551    7556#
A0132   012412            7580    7591#
A0133   012530            7637    7644#
A0136   012766            7761    7766#
A0140   013156            7843    7849#
A015    001256            3324    3329#
A0160   014252            8423    8428#
A0162   014354            8500    8505#
A017    001340            3395    3400#
A020    001372            3432    3437#
A021    001422            3468    3473#
A0224   015724            9616    9621#
A0226   016036            9696    9701#
A023    001512            3539    3544#
A0230   016156            9781    9786#
A0232   016352            9889    9894#
A0234   016504            9975    9980#
A0235   016564           10022   10027#
A0236   016644           10071   10076#
A0237   017006           10146   10151#
A0240   017062           10192   10197#
A0241   017142           10238   10243#
A0242   017222           10284   10289#
A0243   017300           10330   10335#
A0244   017354           10376   10381#
A0245   017434           10422   10427#
A0246   017514           10468   10473#
A0247   017572           10514   10519#
A0250   017652           10560   10565#
A0251   017730           10605   10610#
A0252   020010           10650   10655#
A0253   020066           10695   10700#
A0254   020146           10740   10745#
A0255   020226           10785   10790#
A0256   020306           10830   10835#
A0257   020366           10876   10881#
A0260   020450           10922   10927#
A0261   020530           10968   10973#
A0262   020612           11014   11019#
A0263   020674           11060   11065#
A0264   020750           11102   11107#
A0265   021040           11150   11155#
A0266   021120           11192   11197#
A0267   021212           11240   11245#
A0270   021272           11282   11287#
A0271   021364           11330   11335#
A0272   021440           11371   11376#
A0273   021526           11418   11423#
A0274   021616           11465   11470#
A0275   021674           11509   11514#
A0276   021752           11553   11557#
A0277   022026           11595   11599#
A0300   022106           11638   11642#
A0301   022164           11682   11686#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
A0302   022242          11725   11729#
A0303   022322          11768   11772#
A0304   022400          11811   11815#
A0305   022460          11854   11858#
A0306   022534          11896   11900#
A0307   022612          11939   11943#
A0310   022672          11982   11986#
A0311   022746          12025   12029#
A0312   023026          12069   12073#
A0313   023106          12113   12117#
A0314   023162          12157   12161#
A0315   023242          12200   12204#
A0316   023320          12243   12247#
A0317   023400          12285   12289#
A032    001720           3751    3756#
A0320   023456          12328   12332#
A0321   023536          12371   12375#
A0322   023616          12414   12418#
A0323   023674          12456   12460#
A0324   023750          12499   12504#
A0325   024032          12546   12551#
A0326   024112          12591   12595#
A0327   024170          12634   12638#
A033    001762           3790    3795#
A0330   024264          12684   12688#
A0331   024344          12729   12733#
A0332   024424          12773   12777#
A0333   024506          12817   12821#
A0334   024600          12864   12868#
A0335   024662          12908   12912#
A0336   024740          12951   12955#
A0337   025020          12995   12999#
A034    002024           3827    3832#
A0340   025102          13039   13043#
A0341   025160          13083   13087#
A0342   025242          13127   13131#
A0343   025324          13171   13175#
A0344   025402          13215   13219#
A0345   025464          13259   13263#
A0346   025544          13303   13307#
A0347   025626          13346   13350#
A0350   025706          13390   13394#
A0351   025770          13434   13438#
A0352   026052          13478   13482#
A0353   026132          13521   13525#
A0354   026214          13566   13571#
A0355   026274          13610   13615#
A0356   026354          13655   13660#
A0357   026434          13699   13704#
A0360   026514          13743   13748#
A0361   026576          13786   13791#
A0363   026730          13866   13871#
A0365   027062          13945   13950#
A0367   027214          14024   14029#
A0371   027346          14105   14110#
A0372   027432          14149   14154#
```

```
A0373   027506          14190   14195#
A0374   027576          14235   14240#
A0375   027662          14278   14283#
A0376   027740          14320   14325#
A0377   030024          14363   14368#
A0404   030352          14553   14561#
A0405   030444          14599   14607#
A0406   030540          14645   14653#
A0407   030634          14691   14699#
A041    002172           3982    3987#
A0410   030730          14737   14745#
A0411   031022          14783   14791#
A0412   031114          14829   14837#
A0413   031210          14875   14883#
A0420   031542          15077   15082#
A0421   031622          15122   15127#
A0422   031706          15167   15172#
A0423   031772          15212   15217#
A0424   032050          15257   15262#
A0425   032134          15303   15308#
A0426   032222          15349   15354#
A0427   032310          15395   15400#
A0430   032372          15444   15449#
A0431   032452          15492   15497#
A0432   032536          15540   15545#
A0433   032622          15588   15593#
A0434   032706          15636   15641#
A0435   032770          15682   15687#
A0436   033054          15727   15732#
A0437   033140          15771   15776#
A0440   033224          15816   15821#
A0441   033304          15860   15865#
A0442   033372          15904   15909#
A0443   033462          15949   15954#
A0444   033570          16000   16005#
A0445   033650          16042   16048#
A0446   033732          16085   16091#
A0447   034014          16128   16134#
A0450   034074          16171   16177#
A0453   034306          16295   16300#
A0454   034376          16344   16349#
A0455   034466          16392   16397#
A0456   034556          16441   16446#
A0457   034646          16490   16495#
A046    002374           4138    4143#
A0460   034750          16545   16550#
A0461   035052          16600   16605#
A0462   035154          16655   16660#
A0463   035260          16710   16715#
A0464   035364          16766   16771#
A0465   035470          16821   16826#
A0466   035574          16877   16882#
A0467   035700          16932   16937#
A0470   036002          16987   16992#
A0471   036104          17042   17047#
A0472   036206          17097   17102#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

A0473	036310	17152	17157#
A0474	036414	17208	17213#
A0475	036520	17263	17268#
A0476	036624	17319	17324#
A0477	036732	17375	17380#
A0500	037026	17425	17430#
A0501	037122	17475	17480#
A0502	037216	17525	17530#
A0503	037312	17575	17580#
A0504	037420	17628	17633#
A0505	037514	17678	17683#
A0506	037610	17728	17733#
A0515	040224	17999	18004#
A0516	040306	18046	18051#
A0521	040474	18162	18167#
A0522	040552	18203	18208#
A0524	040702	18285	18291#
A0525	040766	18330	18335#
A0526	041050	18376	18381#
A0527	041134	18421	18426#
A0537	041672	18737	18742#
A0540	041750	18781	18786#
A0541	042034	18825	18830#
A0542	042112	18869	18874#
A0543	042176	18914	18919#
A0544	042274	18963	18968#
A0545	042356	19008	19013#
A0546	042440	19053	19058#
A0547	042522	19097	19102#
A0550	042606	19141	19146#
A0551	042666	19186	19191#
A0552	042754	19231	19236#
A0553	043034	19276	19281#
A0554	043122	19321	19326#
A0555	043210	19366	19371#
A0556	043276	19411	19416#
A0557	043362	19457	19462#
A0560	043446	19502	19507#
A0561	043534	19547	19552#
A0562	043614	19591	19596#
A0563	043704	19636	19641#
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A0565	044046	19724	19729#
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A0570	044274	19857	19862#
A0571	044362	19902	19907#
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A0573	044534	19991	19996#
A0574	044626	20037	20042#
A0575	044720	20083	20088#
A0576	045012	20129	20134#
A0577	045104	20175	20180#
A0600	045174	20222	20227#
A0601	045266	20269	20274#
A0602	045356	20315	20320#

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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A0622	046564	20942	20951#	
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A0632	047344	21320	21326#	
A0633	047426	21376#	21385	
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A0635	047566	21463	21471#	
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A0645	050342	21810	21815#	
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A0657	051230	22242	22252#	
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A0711	055300	23312	23325#	
A0712	055416	23345	23358#	
A0713	055534	23378	23391#	
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A0715	056116	23469	23498#	

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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A0733   060132          24093   24106#
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A0735   060326          24172   24183#
A0736   060404          24210   24221#
A0737   060462          24247   24257#
A0740   060540          24284   24297#
A0741   060646          24335   24350#
A0742   060754          24389   24404#
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BEMSG   067452          26526   27049#
BERFLG  066714           7795*   7801*  26517*  26976#
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BETST   065152           7792   26517#
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                        23141   24537   25763   26954#
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BT002   001004           2974    2996#
BT003   001016           2998    3025#   3032
BT004   001032           3028    3052#   3061
BT005   001050           3057    3081#   3090
BT006   001066           3086    3110#   3117
BT007   001100           3114    3137#   3146
BT010   001114           3142    3166#   3175
BT011   001132           3172    3199#   3209
BT012   001152           3206    3229#   3238
BT013   001172           3235    3258#   3269
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BT015   001240           3296    3319#   3327   3334
BT016   001266           3331    3355#   3366
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BT022   001434          3475    3499#   3509
BT023   001460          3506    3529#   3542    3549
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BT025   001550          3576    3601#   3609
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BT027   001610          3634    3658#   3666
BT030   001630          3663    3687#   3695
BT031   001650          3692    3715#   3723
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BT033   001732          3758    3783#   3793    3800
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BT035   002036          3834    3857#   3866
BT036   002056          3863    3886#   3895
BT037   002076          3892    3915#   3924
BT040   002116          3921    3944#   3955
BT041   002144          3952    3974#   3985    3992
BT042   002204          3989    4013#   4023
BT043   002224          4020    4043#   4054
BT044   002246          4051    4074#
BT045   002274          4081    4084    4103#   4113
BT046   002322          4110    4119#   4141    4147
B0024   004164          4829    4834#
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B0100   007612          6458    6463#
B0101   007716          6512    6517#
B0102   010022          6566    6571#
B0103   010124          6620    6625#
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B0117   011370          7157    7163#
B0126   012042          7414    7420#
B0130   012230          7499    7505#
B0132   012434          7593    7599#
B0133   012546          7645    7651#
B0230   016224          9803    9808#
B0236   016712         10093   10098#
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B0266   021132         11198   11203#
B0270   021304         11288   11293#
B0272   021452         11377   11382#
B0327   024202         12639   12644#
B0457   034660         16496   16501#
B0460   034762         16551   16556#
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B0462   035166         16661   16666#
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B0464   035376         16772   16777#
B0465   035502         16827   16832#
B0466   035606         16883   16888#
B0467   035710         16938   16943#
B0470   036012         16993   16998#
B0471   036114         17048   17053#
B0472   036216         17103   17108#
B0473   036322         17158   17163#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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B0623   046644          20995   21000#
B0625   047016          21098   21103#
B0627   047140          21186   21191#
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B0637   047736          21559   21564#
B0640   050004          21597   21601#
B0642   050134          21682   21688#
B0643   050176          21721   21725#
B0644   050304          21776   21782#
B0646   050440          21864   21870#
B0655   051024          22138   22143#
B0656   051132          22196   22201#
B0657   051244          22254   22261#
B0660   051350          22308   22315#
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B0663   051740          22486   22492#
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B0671   052542          22700   22707#
B0672   052702          22762   22768#
B0673   053106          22839   22845#
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B0711   055310          23323   23329#
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CHKKF   066426          26867   26902#
CHKKJ   066352          26866   26889#
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CHKKW   066562          26869   26931#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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C0103   010136           6626    6631#
C0116   011300           7109    7114#
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C0130   012246           7506    7512#
C0132   012452           7600    7606#
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C0643   050212          21733#
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C0715   056152          23471   23514#
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C0732   060050          24072   24075   24081#
C0733   060144          24104   24107   24113#
C0734   060244          24137   24140   24146#
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                        18239   18277   18322   18368   18413   18458   18497   20354   20395   20433   20472   20511   20550
                        20589   20628   20778   27072   27213#
DBTB    070156           6707    6720    6792    6805    6876    6961    7227    7296   27073   27216#
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DIGTAB  066644          26756   26956#
DMRET   062104          24868#
DONE1   064560          26303   26308#
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                         5775    5815    5890    6445    6446    6457    6463    6499    6500    6501    6511    6517    6553
                         6554    6555    6565    6571    6607    6608    6619    6625    7004    7016    7045    7057   12626
                        14182   14227   14269   14312   14354   14433   14470   14507   14544   14590   14636   14682   14728
                        14774   14820   14866   14913   14952   14991   15030   15850   16284   16333   16380   16429   16479
                        16534   16588   16643   16699   16755   16809   16865   16921   16976   17030   17085   17141   17197
                        17251   17307   17364   17414   17463   17513   17564   17617   17666   17716   19537   19581   19670
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DWTB    070136           5222    5224    5855    6833    6918    7142    7150    7193    7261   15806   27071   27206#
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D0656   051156          22191   22215#
D0661   051454          22368   22369   22370   22373#
D0662   051612          22440   22441   22442   22445#
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EOP1    067147          26274   27013#
EOP2    067176          26280   27018#
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ERHDR1  066732          26653   26987#
ERHDR2  067034          26655   26999#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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ERRFLG  066676          7718*   7723*  26637*  26969#
ERROR = 104000          2928#   7721    9482    9515    9618    9624    9659    9698    9705    9741    9783    9789    9805
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                       10101   10107   10148   10154   10194   10200   10240   10246   10286   10292   10332   10338   10378
                       10384   10424   10430   10470   10476   10516   10522   10568   10613   10658   10703   10748   10793
                       10839   10885   10931   10977   11023   11069   11117   11159   11207   11249   11297   11339   11386
                       11427   11473   11517   11560   11602   11645   11689   11732   11775   11818   11861   11903   11946
                       11989   12032   12076   12120   12164   12207   12250   12292   12335   12378   12421   12463   12508
                       12555   12599   12648   12692   12737   12781   12825   12872   12916   12959   13003   13047   13091
                       13135   13179   13223   13267   13311   13354   13398   13442   13486   13529   13568   13574   13612
                       13618   13657   13663   13701   13707   13745   13751   13795   13833   13875   13911   13954   13991
                       14033   14069   14113   14157   14192   14237   14280   14322   14365   14407   14444   14481   14518
                       14557   14603   14649   14695   14741   14787   14833   14879   14925   14964   15003   15042   15079
                       15085   15124   15130   15169   15175   15214   15220   15259   15266   15305   15312   15351   15358
                       15397   15404   15446   15452   15494   15500   15542   15548   15590   15596   15638   15644   15691
                       15736   15780   15824   15868   15912   15958   16009   16045   16088   16131   16174   16218   16256
                       16305   16354   16402   16451   16506   16561   16616   16671   16726   16782   16837   16893   16948
                       17003   17058   17113   17168   17224   17279   17335   17385   17435   17485   17535   17585   17638
                       17688   17738   17775   17812   17849   17887   17924   17963   18007   18054   18092   18127   18164
                       18205   18249   18288   18339   18385   18430   18469   18508   18548   18586   18624   18662   18701
                       18745   18789   18833   18877   18923   18971   19016   19061   19105   19150   19195   19240   19285
                       19330   19375   19420   19466   19511   19555   19599   19644   19688   19732   19776   19820   19865
                       19910   19955   20000   20046   20092   20138   20184   20231   20278   20324   20363   20405   20444
                       20483   20522   20561   20600   20639   20676   20714   20750   20789   22146   22154   22204   22212
                       22256   22266   22310   22320   22514   22536   22563   22653   22704   22773   22850   24300   24346
                       24357   24400   24411   24455   24466   25929   25998   26071   26141   26199   26251
ERROR1= 104001          2929#
ERROR2= 104002          2930#
ERROR3= 104003          2931#
ERROR4= 104004          2932#
ERROR5= 104005          2933#   8061    8092    8097    8102    8107    8139    8168    8198    8229    8261    8294    8326
                        8357    8394    8425    8434    8471    8502    8511    8542    8575    8606    8638    8670    8702
                        8734    8767    8800    8836    8869    8898    8932    8965    8998    9029    9062    9094    9126
                        9159    9192    9223    9256    9289    9321    9353    9386    9419    9451    9547    9579   10562
                       10607   10652   10697   10742   10787   10832   10878   10924   10970   11016   11062   11104   11110
                       11152   11194   11200   11242   11284   11290   11332   11373   11379   11420   11467   11511   11555
                       11597   11640   11684   11727   11770   11813   11856   11898   11941   11984   12027   12071   12115
                       12159   12202   12245   12287   12330   12373   12416   12458   12501   12548   12593   12636   12641
                       12686   12731   12775   12819   12866   12910   12953   12997   13041   13085   13129   13173   13217
                       13261   13305   13348   13392   13436   13480   13523   13788   13868   13947   14026   14107   14151
                       14198   14243   14286   14328   14371   14564   14610   14656   14702   14748   14794   14840   14886
                       15684   15729   15773   15818   15862   15906   15951   16002   16051   16094   16137   16180   16297
                       16346   16394   16443   16492   16498   16547   16553   16602   16608   16657   16663   16712   16718
                       16768   16774   16823   16829   16879   16885   16934   16940   16989   16995   17044   17050   17099
                       17105   17154   17160   17210   17216   17265   17271   17321   17327   17377   17427   17477   17527
                       17577   17630   17680   17730   18001   18048   18170   18211   18294   18332   18378   18423   18739
                       18783   18827   18871   18916   18965   19010   19055   19099   19143   19188   19233   19278   19323
                       19368   19413   19459   19504   19549   19593   19638   19682   19726   19770   19814   19859   19904
                       19948   19993   20039   20085   20131   20177   20224   20271   20317   21468   21476   21509   21515
                       21521   21553   21561   21591   21598   21631   21639   21672   21680   21685   21718   21722   21730
                       21766   21774   21779   21812   21821   21853   21862   21867   22131   22140   22189   22198   22248
                       22302   22355   22363   22382   22427   22435   22454   23558   23600   23608   23615   23654   23662
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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                    24255   24292   24506   24550   24594   24638   24682   24725   24767   24811   24853   24908   24944
                    24981   25016   25052   25090   25128   25163   25198   25234   25271   25306   25344   25380   25415
                    25450   25488   25526   25563   25598   25633   25667   25701   25737   25777   25810   25861
ERROR6= 104006       2934#  20819   20828   20860   20869   20900   20909   20915   20947   20956   20988   20997   21003
                    21007   21041   21050   21055   21086   21091   21100   21106   21138   21147   21179   21188   21194
                    21198   21230   21239   21244   21276   21285   21289   21322   21331   21335   21368   21372   21381
                    21387   21419   21423   21432   21438   21899   21947   21950   21985   22022   22059   22096   22375
                    22447   22489   22599   22645   22696   22756   22764   22777   22833   22841   22854   22890   22924
                    22958   22992   23026   23060   23092   23124   23159   23191   23225   23260   23293   23326   23359
                    23392   23440   23445   23803   23812   23821   23846   23855   23863   23890   23899   23908   23949
                    23959   23969   23979   24010   24020   24030   24040
ERROR7= 104007       2935#  22392   22464   23503   23510   23517   23523   23529   23926
ERRTN   066656      2645*   26707   26961#
EX002   001010       3000#
E0001   003050       4186#
E0002   003066       4210    4214#
E0003   003102       4240#
E0004   003120       4263    4267#
E0005   003142       4292    4296#
E0006   003162       4323#
E0007   003222       4357#
E001    001002       2976#
E0010   003260       4389#
E0011   003316       4422#
E0014   003454       4529#
E0015   003512       4562#
E0016   003560       4599#
E0017   003626       4634#
E0020   003716       4674    4677#
E0025   004236       4873#
E0026   004306       4908#
E0027   004346       4941#
E003    001026       3025    3026    3027    3030#
E0030   004412       4975#
E0031   004462       5010#
E004    001044       3054    3055    3056    3059#
E0042   005256       5357#
E0043   005322       5392#
E0044   005374       5427#
E0045   005442       5462#
E0047   005566       5535#
E005    001062       3083    3084    3085    3088#
E0050   005616       5563#
E0051   005664       5599#
E0052   005732       5633#
E0055   006140       5751#
E006    001074       3116#
E0060   006346       5865#
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E0064   006626       6017#
E0065   006670       6050#
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E0067   007000       6117#
E007    001110       3144#
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E0071   007114       6185#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E0075   007356          6332#
E0076   007430          6368#
E010    001126          3171    3174#
E011    001146          3205    3208#
E0116   011252          7098#
E0117   011352          7153#
E012    001166          3237#
E0120   011450          7203#
E0121   011522          7237#
E0122   011574          7271#
E0123   011646          7306#
E0127   012126          7460#
E013    001212          3268#
E0131   012330          7553#
E0133   012542          7648#
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E0135   012702          7726#
E0136   012762          7763#
E0137   013060          7804#
E014    001234          3298#
E0140   013150          7831    7845#
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E0142   013276          7917#
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E0147   013760          8136    8139#
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E0153   014074          8258    8261#
E0154   014116          8294#
E0155   014142          8323    8326#
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E0203   015144          9059    9062#
E0204   015170          9094#
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E0216   015506          9419#
E0217   015532          9451#
E022    001454          3503    3504    3505    3508#
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E043    002242          4053#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E0523   040626          18249#
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E0531   041272          18508#
E0532   041342          18548#
E0533   041412          18586#
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E0535   041536          18662#
E0536   041612          18701#
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E0604   045510          20405#
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E0607   045704          20522#
E0610   045756          20561#
E0611   046032          20600#
E0612   046106          20639#
E0613   046152          20676#
E0614   046224          20714#
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E0663   051734          22489#
E0664   052010          22514#
E0665   052056          22536#
E0667   052272          22599#
E0674   053254          22890#
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E0677   053642          22992#
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E0701   054106          23060#
E0702   054222          23092#
E0703   054336          23124#
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E0707   055050          23260#
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E0711   055304          23326#
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E0713   055540          23392#
E0716   056274          23558#
E0721   056612          23693#
E0722   056672          23718#
E0723   056752          23743#
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E0735   060322          24174   24180#
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E0737   060456          24255#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E0750   061524          24682#
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E0752   061670          24767#
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E0755   062144          24908#
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E0760   062314          25016#
E0761   062354          25052#
E0762   062420          25090#
E0763   062464          25128#
E0764   062524          25163#
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E0767   062670          25271#
E0770   062730          25306#
E0771   062774          25344#
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E0773   063074          25415#
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E0776   063244          25526#
E0777   063310          25554   25563#
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E1001   063410          25631   25633#
E10012  003350           4453#
E10013  003410           4490#
E1002   063446          25667#
E10021  003760           4706    4709#
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E10023  004076           4787#
E10024  004150           4825#
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E10032  004522           5042#
E10033  004572           5080#
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E10036  004756           5192#
E10037  005032           5231#
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E10040  005116           5273#
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E10046  005506           5496#
E1005   063630          25773   25777#
E10053  006000           5668#
E10054  006060           5710#
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E10057  006266           5825#
E1006   063672          25810#  25814
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E1007   063762          25859   25861#
E10074  007276           6291#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E10102  010004          6562#
E10103  010106          6616#
E10104  010224          6674#
E10105  010314          6717#
E10106  010404          6760#
E10107  010474          6802#
E1011   064110         25998#
E1C110  010562          6844#
E10111  010650          6887#
E10112  010740          6929#
E10113  011030          6972#
E10114  011106          7013#
E10115  011164          7054#
E10116  011264          7105#
E10117  011364          7160#
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E10124  011700          7336#
E10125  011740          7371#   7374
E10126  012014          7409#
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E10130  012202          7494#   7505
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E1014   064306         26199#
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E1015A  001252          3326#
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E10162  014350          8502#
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E1021   001416          3470#
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E10232  016346          9886    9887    9888    9891#
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E10271  021360          11332#
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E10273  021522          11420#
E10274  021612          11462   11463   11464   11467#
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E10276  021746          11550   11551   11552   11555#
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E10302  022236          11722   11723   11724   11727#
E10303  022316          11765   11766   11767   11770#
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E10317  023374          12282   12283   12284   12287#
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E10321  023532          12368   12369   12370   12373#
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E10323  023670          12453   12454   12455   12458#
E10324  023744          12496   12497   12498   12501#
E10325  024026          12543   12544   12545   12548#
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E10327  024164          12631   12632   12633   12636#
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E10330  024260          12681   12682   12683   12686#
E10331  024340          12726   12727   12728   12731#
E10332  024420          12770   12771   12772   12775#
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E10377  030020          14365#
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E10406  030530          14649#
E10407  030624          14695#
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E10410  030720          14741#
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E10434  032702          15633   15634   15635   15638#
E10435  032764          15679   15680   15681   15684#
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E10441  033300          15857   15858   15859   15862#
E10442  033366          15901   15902   15903   15906#
E10443  033456          15946   15947   15948   15951#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E10460	034744	16542	16543	16544	16547#
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E10474	036410	17205	17206	17207	17210#
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E10504	037414	17625	17626	17627	17630#
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E10552	042750	19228	19229	19230	19233#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E10565  044042          19721   19722   19723   19726#
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E10567  044206          19809   19810   19811   19814#
E10570  044270          19854   19855   19856   19859#
E10571  044356          19899   19900   19901   19904#
E10572  044442          19943   19944   19945   19948#
E10573  044530          19988   19989   19990   19993#
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E10576  045006          20126   20127   20128   20131#
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E10601  045262          20266   20267   20268   20271#
E10602  045352          20312   20313   20314   20317#
E10617  046370          20819#
E10620  046434          20860#
E10621  046500          20900#
E10622  046556          20947#
E10623  046622          20988#
E10624  046710          21041#
E10625  046764          21086#
E10626  047052          21138#
E10627  047116          21179#
E10630  047204          21230#
E10631  047262          21276#
E10632  047336          21322#
E10633  047412          21368#
E10634  047476          21419#
E10635  047562          21468#
E10636  047640          21509#  21518
E10637  047716          21553#
E10640  047764          21591#
E10641  050034          21631#
E10642  050104          21672#
E10643  050164          21718#
E10644  050254          21766#
E10645  050336          21807   21810   21812#
E10646  050410          21848   21851   21853#
E10650  050542          21947#
E10655  051002          22131#
E10656  051110          22189#
E10657  051222          22248#
E10660  051326          22302#
E10661  051424          22355#
E10662  051562          22427#
E10666  052154          22563#
E10670  052402          22645#
E10671  052516          22696#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
E10672  052654          22756#
E10673  053060          22833#
E10714  055706          23440#
E10715  056130          23503#
E10717  056366          23600#
E10720  056506          23654#
E10725  057100          23803#
E10726  057214          23846#
E10727  057330          23890#
E10730  057504          23949#
E10731  057656          24010#
E10732  060030          24069#
E10733  060124          24101#
E10734  060224          24134#
E10740  060532          24292#
E10741  060640          24346#
E10742  060746          24400#
E10743  061064          24455#
E20012  003360           4459#
E20013  003420           4496#
E2002   001014           3004#
E20021  003772           4715#
E20022  004042           4755#
E20023  004110           4793#
E20024  004160           4831#
E20032  004532           5048#
E20033  004602           5086#
E20034  004652           5123#
E20035  004722           5161#
E20036  004770           5199#
E20037  005044           5238#
E20040  005130           5280#
E20041  005202           5319#
E20046  005520           5502#
E20053  006010           5674#
E20054  006070           5716#
E20056  006222           5792#
E20057  006300           5831#
E20062  006510           5943#
E20063  006564           5984#
E20074  007310           6298#
E20077  007520           6414#
E20100  007606           6460#
E20101  007712           6514#
E20102  010016           6568#
E20103  010120           6622#
E20104  010236           6680#
E20105  010326           6723#
E20106  010416           6766#
E20107  010506           6808#
E20110  010574           6850#
E20111  010662           6893#
E20112  010752           6935#
E20113  011042           6978#
E20114  011120           7019#
E20115  011176           7060#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
E20116  011274          7111#
E20117  011374          7166#
E20124  011710          7342#
E20125  011752          7377#
E20126  012036          7417#
E20130  012224          7502#
E20132  012430          7596#
E20146  013720          8097#
E2015   001262          3333#
E20160  014270          8434#
E20162  014370          8511#
E2C17   001346          3404#
E2020   001376          3440#
E2021   001430          3477#
E20224  015730          9624#
E20226  016044          9705#
E20230  016162          9789#
E20232  016356          9897#
E20234  016510          9983#
E20235  016570         10030#
E20236  016650         10079#
E20237  017012         10154#
E20240  017066         10200#
E20241  017146         10246#
E20242  017226         10292#
E20243  017304         10338#
E20244  017360         10384#
E20245  017440         10430#
E20246  017520         10476#
E20247  017576         10522#
E20250  017656         10568#
E20251  017734         10613#
E20252  020014         10658#
E20253  020072         10703#
E20254  020152         10748#
E20255  020232         10793#
E20256  020314         10839#
E20257  020374         10885#
E20260  020456         10931#
E20261  020536         10977#
E20262  020620         11023#
E20263  020702         11069#
E20264  020756         11110#
E20265  021046         11159#
E20266  021126         11200#
E20267  021220         11249#
E20270  021300         11290#
E20271  021372         11339#
E20272  021446         11379#
E20273  021534         11427#
E20274  021622         11473#
E20275  021700         11517#
E20276  021756         11560#
E20277  022032         11602#
E20300  022112         11645#
E20301  022170         11689#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
E20302  022246          11732#
E20303  022326          11775#
E20304  022404          11818#
E20305  022464          11861#
E20306  022540          11903#
E20307  022616          11946#
E20310  022676          11989#
E20311  022752          12032#
E20312  023032          12076#
E20313  023112          12120#
E20314  023166          12164#
E20315  023246          12207#
E20316  023324          12250#
E20317  023404          12292#
E2032   001726           3760#
E20320  023462          12335#
E20321  023542          12378#
E20322  023622          12421#
E20323  023700          12463#
E20324  023756          12508#
E20325  024040          12555#
E20326  024120          12599#
E20327  024176          12641#
E2033   001770           3799#
E20330  024272          12692#
E20331  024352          12737#
E20332  024432          12781#
E20333  024514          12825#
E20334  024606          12872#
E20335  024670          12916#
E20336  024746          12959#
E20337  025026          13003#
E2034   002032           3836#
E20340  025110          13047#
E20341  025166          13091#
E20342  025250          13135#
E20343  025332          13179#
E20344  025410          13223#
E20345  025472          13267#
E20346  025552          13311#
E20347  025634          13354#
E20350  025714          13398#
E20351  025776          13442#
E20352  026060          13486#
E20353  026140          13529#
E20354  026220          13574#
E20355  026300          13618#
E20356  026360          13663#
E20357  026440          13707#
E20360  026520          13751#
E20361  026604          13795#
E20363  026736          13875#
E20365  027070          13954#
E20367  027222          14033#
E20371  027352          14113#
E20372  027436          14157#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
E20373  027514          14198#
E20374  027604          14243#
E20375  027670          14286#
E20376  027746          14328#
E20377  030032          14371#
E20404  030360          14564#
E20405  030452          14610#
E20406  030546          14656#
E20407  030642          14702#
E2041   002200           3991#
E20410  030734          14748#
E20411  031026          14794#
E20412  031122          14840#
E20413  031216          14886#
E20420  031546          15085#
E20421  031626          15130#
E20422  031712          15175#
E20423  031776          15220#
E20424  032056          15266#
E20425  032142          15312#
E20426  032230          15358#
E20427  032316          15404#
E20430  032376          15452#
E20431  032456          15500#
E20432  032542          15548#
E20433  032626          15596#
E20434  032712          15644#
E20435  032776          15691#
E20436  033062          15736#
E20437  033146          15780#
E20440  033230          15824#
E20441  033310          15868#
E20442  033376          15912#
E20443  033470          15958#
E20444  033576          16009#
E20445  033656          16051#
E20446  033740          16094#
E20447  034020          16137#
E20450  034102          16180#
E20453  034316          16305#
E20454  034406          16354#
E20455  034476          16402#
E20456  034566          16451#
E20457  034654          16498#
E2046   002402           4146#
E20460  034756          16553#
E20461  035060          16608#
E20462  035162          16663#
E20463  035266          16718#
E20464  035372          16774#
E20465  035476          16829#
E20466  035602          16885#
E20467  035704          16940#
E20470  036006          16995#
E20471  036110          17050#
E20472  036212          17105#
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E20473  036316          17160#
E20474  036422          17216#
E20475  036526          17271#
E20476  036632          17327#
E20477  036742          17385#
E20500  037036          17435#
E20501  037132          17485#
E20502  037226          17535#
E20503  037322          17585#
E20504  037430          17638#
E20505  037524          17686#
E20506  037620          17738#
E20515  040230          18007#
E20516  040312          18054#
E20521  040502          18170#
E20522  040560          18211#
E20524  040710          18294#
E20525  040774          18339#
E20526  041056          18385#
E20527  041142          18430#
E20537  041676          18745#
E20540  041754          18789#
E20541  042040          18833#
E20542  042116          18877#
E20543  042204          18923#
E20544  042300          18971#
E20545  042362          19016#
E20546  042444          19061#
E20547  042526          19105#
E20550  042614          19150#
E20551  042674          19195#
E20552  042762          19240#
E20553  043042          19285#
E20554  043130          19330#
E20555  043216          19375#
E20556  043304          19420#
E20557  043370          19466#
E20560  043454          19511#
E20561  043540          19555#
E20562  043620          19599#
E20563  043710          19644#
E20564  043770          19688#
E20565  044052          19732#
E20566  044134          19776#
E20567  044216          19820#
E20570  044300          19865#
E20571  044366          19910#
E20572  044454          19955#
E20573  044542          20000#
E20574  044634          20046#
E20575  044726          20092#
E20576  045020          20138#
E20577  045112          20184#
E20600  045202          20231#
E20601  045274          20278#
E20602  045364          20324#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E20617  046406          20823   20824   20825   20828#
E20620  046452          20864   20865   20866   20869#
E20621  046516          20904   20905   20906   20909#
E20622  046574          20951   20952   20953   20956#
E20623  046640          20992   20993   20994   20997#
E20624  046726          21045   21046   21047   21050#
E20625  046774          21081   21091#  21103
E20626  047070          21142   21143   21144   21147#
E20627  047134          21183   21184   21185   21188#
E20630  047222          21234   21235   21236   21239#
E20631  047300          21280   21281   21282   21285#
E20632  047354          21326   21327   21328   21331#
E20633  047420          21363   21366   21372#
E20634  047504          21414   21417   21423#
E20635  047576          21476#
E20636  047652          21515#
E20637  047732          21556   21557   21558   21561#
E20640  050000          21594   21595   21596   21598#
E20641  050050          21639#
E20642  050120          21680#
E20643  050172          21713   21722#
E20644  050270          21774#
E20645  050352          21821#
E20646  050424          21862#
E20650  050550          21935   21950#
E20655  051020          22135   22136   22137   22140#
E20656  051126          22193   22194   22195   22198#
E20657  051240          22256#
E20660  051344          22310#
E20661  051436          22363#
E20662  051574          22435#
E20670  052422          22653#
E20671  052536          22704#
E20672  052674          22764#
E20673  053100          22841#
E20714  055716          23445#
E20715  056144          23510#
E20717  056406          23608#
E20720  056524          23662#
E20725  057120          23812#
E20726  057234          23855#
E20727  057350          23899#
E20730  057524          23959#
E20731  057676          24020#
E20732  060044          24078#
E20733  060140          24110#
E20734  060240          24143#
E20740  060550          24300#
E20741  060666          24357#
E20742  060774          24411#
E20743  061112          24466#
E30024  004172           4838#
E30077  007532           6421#
E30100  007620           6466#
E30101  007724           6520#
E30102  010030           6574#
```

```
E30103  010132            6628#
E30126  012046            7423#
E30130  012242            7509#
E30132  012446            7603#
E30146  013726            8102#
E30230  016220            9800    9801    9802    9805#
E30236  016706           10090   10091   10092   10095#
E30264  020770           11117#
E30266  021140           11207#
E30270  021312           11297#
E30272  021460           11386#
E30327  024210           12648#
E30457  034670           16506#
E30460  034772           16561#
E30461  035074           16616#
E30462  035176           16671#
E30463  035302           16726#
E30464  035406           16782#
E30465  035512           16837#
E30466  035616           16893#
E30467  035720           16948#
E30470  036022           17003#
E30471  036124           17058#
E30472  036226           17113#
E30473  036332           17168#
E30474  036436           17224#
E30475  036542           17279#
E30476  036646           17335#
E30621  046530           20915#
E30623  046652           21003#
E30624  046736           21055#
E30625  047012           21095   21096   21097   21100#
E30627  047146           21194#
E30631  047306           21271   21274   21289#
E30632  047362           21317   21320   21335#
E30633  047436           21376   21377   21378   21381#
E30634  047522           21427   21428   21429   21432#
E30636  047664           21521#
E30642  050130           21685#
E30643  050206           21730#
E30644  050300           21761   21779#
E30646  050434           21867#
E30655  051030           22146#
E30656  051136           22204#
E30657  051254           22266#
E30660  051360           22320#
E30661  051462           22375#
E30662  051620           22447#
E30672  052722           22773#
E30673  053126           22850#
E30715  056162           23517#
E30717  056424           23615#
E30720  056536           23669#
E30725  057140           23821#
E30726  057254           23863#
E30727  057370           23908#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
E30730  057544          23969#
E30731  057716          24030#
E40100  007632           6473#
E40101  007736           6527#
E40102  010042           6581#
E40103  010144           6635#
E40130  012256           7516#
E40132  012462           7610#
E40146  013734           8107#
E40230  016232           9811#
E40236  016720          10101#
E40623  046662          21007#
E40625  047024          21106#
E40633  047446          21387#
E40634  047532          21438#
E40655  051044          22154#
E40656  051152          22212#
E40661  051500          22382#
E40662  051636          22454#
E40672  052730          22746   22777#
E40673  053134          22823   22854#
E40715  056174          23523#
E40727  057434          23926#
E40730  057566          23979#
E40731  057740          24040#
E50230  016244           9817#
E50236  016732          10107#
E50661  051516          22392#
E50662  051654          22464#
E50715  056206          23529#
FILLS   066660          26807   26962#
FIRST   066704           4665   26346   26972#
F0661   051506          22379   22387#
F0662   051644          22451   22459#
F0715   056170          23483   23521#
G0661   051522          22388   22395#
G0662   051660          22460   22467#
G0715   056202          23492   23527#
H0715   056212          23505   23508   23512   23519   23525   23532#
IBUF    067556           7971    7992   27068#
ICOUNT  066662           4155*  26295*  26583   26963#
IDENT1  067212           8028   27020#
INIT    003000           4144    4154#
ITCNT   066664           4156*  22632*  22683*  26296*  26581*  26583*  26964#
I0001   003046           4184#
I0002   003062           4210#
I0003   003100           4238#
I0004   003114           4263#
I0005   003136           4292#
I0006   003160           4321#
I0007   003214           4352#
I0010   003252           4384#
I0011   003310           4417#
I0012   003342           4449#
I0013   003402           4486#
I0014   003444           4523#
```

```
I0015   003500          4556#
I0016   003544          4593#
I0017   003612          4628#
I002    001012          2996    3002#
I0020   003706          4672#
I0021   003750          4704#
I0022   004022          4744#
I0023   004072          4783#
I0024   004144          4821#
I0025   004226          4868#
I0026   004274          4902#
I0027   004340          4936#
I0030   004400          4969#
I0031   004450          5004#
I0032   004516          5038#
I0033   004566          5076#
I0034   004636          5113#
I0035   004706          5151#
I0036   004752          5188#
I0037   005026          5227#
I004    001034          3054#
I0040   005110          5269#
I0041   005162          5308#
I0042   005240          5349#
I0043   005312          5387#
I0044   005360          5421#
I0045   005430          5456#
I0046   005500          5491#
I0047   005552          5530#
I005    001052          3083#
I0050   005612          5558    5561#
I0051   005652          5593#
I0052   005722          5628#
I0053   005770          5662#
I0054   006046          5704#
I0055   006126          5745#
I0056   006176          5780#
I0057   006260          5820#
I006    001070          3112#
I0060   006336          5860#
I0061   006412          5895#
I0062   006464          5931#
I0063   006544          5973#
I0064   006620          6013#
I0065   006660          6046#
I0066   006722          6079#
I0067   006764          6111#
I007    001104          3140#
I0070   007034          6145#
I0071   007104          6180#
I0072   007152          6216#
I0073   007226          6254#
I0074   007266          6287#
I0075   007344          6326#
I0076   007414          6362#
I0077   007500          6403#
```

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
I010    001120          3169#
I0100   007570          6450#
I0101   007674          6504#
I0102   010000          6558#
I0103   010102          6612#
I0104   010212          6668#
I0105   010302          6711#
I0106   010372          6754#
I0107   010462          6796#
I011    001136          3202#
I0110   010550          6838#
I0111   010636          6881#
I0112   010726          6923#
I0113   011016          6966#
I0114   011100          7008#
I0115   011156          7049#
I0116   011242          7093#
I0117   011342          7148#
I012    001156          3232#
I0120   011434          7197#
I0121   011506          7231#
I0122   011560          7265#
I0123   011632          7300#
I0124   011676          7334#
I0125   011734          7369#
I0126   012012          7407#
I0127   012106          7453#
I013    001200          3262#
I0130   012200          7492#
I0131   012320          7548#
I0132   012404          7586#
I0133   012526          7642#
I0134   012620          7685#
I0135   012672          7721#
I0136   012752          7749    7758#
I0137   013046          7790    7799#
I014    001230          3294#
I0140   013136          7838#
I0141   013224          7877#   7881
I0142   013270          7912#
I0143   013332          7945#
I0145   013656          8052    8055#
I0147   013754          8132    8136#
I015    001246          3322#
I0150   014000          8164    8167#
I0151   014022          8191    8195#
I0152   014046          8223    8227#
I0153   014070          8254    8258#
I0154   014114          8288    8292#
I0155   014136          8319    8323#
I0156   014162          8351    8355#
I0157   014204          8382    8386#
I016    001274          3358#
I0160   014244          8419    8423#
I0161   014310          8459    8463#
I0162   014346          8496    8500#
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I0163   014410          8536    8540#
I0164   014434          8567    8572#
I0165   014462          8598    8603#
I0166   014510          8631    8636#
I0167   014532          8663    8667#
I017    001322          3390#
I0170   014560          8695    8700#
I0171   014604          8727    8732#
I0172   014630          8759    8764#
I0173   014656          8792    8797#
I0174   014716          8825    8833#
I0175   014744          8861    8866#
I0176   014770          8892    8896#
I0177   015014          8924    8929#
I020    001362          3430#
I0200   015042          8957    8962#
I0201   015070          8990    8995#
I0202   015116          9022    9027#
I0203   015140          9055    9059#
I0204   015166          9087    9092#
I0205   015212          9119    9124#
I0206   015236          9152    9157#
I0207   015262          9184    9189#
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I0216   015504          9412    9417#
I0217   015530          9444    9449#
I022    001436          3501#
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I0222   015622          9540    9544#
I0223   015650          9572    9577#
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I0225   015762          9649    9656#
I0226   016020          9684    9691#
I0227   016100          9730    9738#
I023    001474          3534#
I0231   016276          9842    9849#
I0232   016334          9877    9884#
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I0234   016466          9959    9970#
I0235   016546         10009   10017#
I0237   016770         10133   10141#
I024    001534          3574#
I0240   017044         10179   10187#
I0241   017124         10225   10233#
I0242   017204         10271   10279#
I0243   017262         10317   10325#
I0244   017336         10363   10371#
I0245   017416         10409   10417#
I0246   017476         10455   10463#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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I025    001552           3603#
I0250   017634          10548   10555#
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I0252   017772          10638   10645#
I0253   020050          10683   10690#
I0254   020130          10728   10735#
I0255   020210          10773   10780#
I0256   020270          10818   10825#
I0257   020350          10864   10871#
I026    001572           3631#
I0260   020432          10910   10917#
I0261   020512          10956   10963#
I0262   020574          11002   11009#
I0263   020656          11048   11055#
I0264   020740          11093   11100#
I0265   021030          11140   11148#
I0266   021110          11182   11190#
I0267   021202          11230   11238#
I027    001616           3661#
I0270   021262          11272   11280#
I0271   021354          11320   11328#
I0272   021430          11362   11369#
I0273   021516          11409   11416#
I0274   021600          11450   11460#
I0275   021656          11496   11504#
I0276   021734          11541   11548#
I0277   022010          11584   11590#
I030    001636           3690#
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I0301   022146          11670   11677#
I0302   022224          11713   11720#
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I0315   023224          12188   12195#
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I0321   023520          12359   12366#
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I0324   023732          12487   12494#
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I0327   024152          12623   12629#
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I0335   024644          12896   12903#
I0336   024722          12940   12946#
I0337   025002          12983   12990#
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I0354   026176          13554   13561#
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I0364   026774          13898   13905#
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I0366   027132          13977   13985#
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I0406   030514          14634   14642#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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IO42    002212           4017#
IO420   031524          15065   15072#
IO421   031604          15109   15117#
IO422   031670          15154   15162#
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IO427   032272          15382   15390#
IO43    002234           4048#
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IO431   032434          15478   15487#
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IO437   033122          15759   15766#
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I0570	044256	19844	19852#	
I0571	044344	19889	19897#	
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I0575	044702	20069	20078#	
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I0633	047406	21361	21366#	
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I0646	050404	21845	21851#	
I0647	050472	21894	21897	21904#
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I0651	050574	21973	21978#	
I0652	050632	22010	22015#	
I0653	050670	22047	22052#	
I0654	050726	22084	22089#	

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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I0656   051106          22179   22187#
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I0663   051722          22475   22484#
I0664   052002          22502   22509#
I0665   052046          22524   22531#
I0666   052142          22545   22557#
I0667   052256          22580   22593#
I0670   052362          22631   22638#
I0671   052476          22682   22689#
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I0673   053046          22810   22829#  22838
I0674   053240          22872   22884#
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I0677   053626          22974   22986#
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I0711   055266          23309   23319#
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I0714   055672          23414   23434#
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I0733   060120          24091   24098#
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I0735   060314          24169   24177#
I0736   060372          24207   24215#
I0737   060450          24244   24252#
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I0742   060730          24386   24393#
I0743   061046          24439   24448#
I0744   061172          24500*  24503#
I0745   061262          24544*  24547#
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I0747   061434          24632*  24635#
I0750   061522          24676*  24679#
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I1002   063444          25658   25662   25665#
I1003   063502          25692   25696   25699#
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I1013   064232          26134#
I1014   064300          26193#
I10146  013710           8086    8090#
I1015   064344          26245#
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I10726  057212          23841   23844#
I10727  057326          23885   23888#
I10730  057500          23942   23946#
I10731  057652          24003   24007#
I20146  013716           8090    8095#
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I20236  016674          10082   10088#
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I20726  057232          23850   23853#
I20727  057346          23894   23897#
I20730  057520          23952   23956#
I20731  057672          24013   24017#
I30146  013724           8095    8100#
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I30726  057250          23858   23861#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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JMP5    047156          21174  21191  21198#
JMP5A   047232          21225  21244#
JMP7    047444          21366  21385#
JMP7A   047530          21417  21436#
JSR3    050126          21667  21684#
JSR7    050432          21851  21866#
LAST    066706          26267* 26347  26973#
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                        23245  23417  23466
LOGICA  064550          26304#
L1010   064002          25915# 25925  25933  25936
L1011   064060          25984# 25994  26002  26005
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L1013   064214          26127# 26137  26145  26148
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MBUF1   067606           4588   4623   5525   5530*  5925  6661  6704  6747  6789 14555* 14560 14601* 14606
                        14647* 14652  14693* 14698  14739* 14744 14785* 14790 14831* 14836 14877* 14882 15894
                        15938  15988  17951  19625  19892 20026 20072 20118 20164 20211  20258 20305 23476*
                        23507  23514* 23794  23806  23837 23849 24472* 24473* 24862 24863  27075 27079#
MISFLG  066710          26351  26355* 26974#
MISHDR  067477          26354  27053#
MISS    064564          26269  26342#
MT      003642           4641#  4643
OBUF    067546           7972   7993  27063#
ONCE    066722           4159   8024   8026*  26299  26980#
```

D08

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
OPTION  066636          22476   22503   22525   22546   22581   22873   22907   22941   22975   23009   23043   23207   23242
                        23415   23464   24441   24581   24625   24669   24712   24798   26860*  26870   26879*  26892*  26906*
                        26921*  26934*  26946#
OPT1    067270          26864   27028#
OPT2    067334          26883   27034#
OPT3    067347          26896   27036#
OPT4    067362          26910   27038#
OPT5    067375          26925   27040#
OPT6    067410          26938   27042#
OPT7    067423          26873   27044#
ORTAB   067772          26126   26128   27150#
OTA     065760          26276   26282   26288   26357   26457   26528   26725   26742#
00145   013674           8059    8064#
00146   013740           8105    8110#
00147   013764           8137    8142#
00150   014006           8167    8170#
00151   014032           8196    8201#
00152   014054           8227    8232#
00153   014100           8259    8264#
00154   014122           8292    8297#
00155   014146           8324    8329#
00156   014170           8355    8360#
00157   014230           8390    8397#
00160   014274           8430    8437#
00161   014332           8467    8474#
00162   014374           8507    8514#
00163   014416           8540    8545#
00164   014444           8573    8577#
00165   014472           8604    8609#
00166   014516           8636    8641#
00167   014542           8668    8673#
00170   014566           8700    8705#
00171   014612           8732    8737#
00172   014640           8765    8770#
00173   014666           8798    8803#
00174   014726           8834    8839#
00175   014754           8867    8872#
00176   014776           8896    8901#
00177   015024           8930    8935#
00200   015052           8963    8968#
00201   015100           8996    9001#
00202   015124           9027    9032#
00203   015150           9060    9065#
00204   015174           9092    9097#
00205   015220           9124    9129#
00206   015244           9157    9162#
00207   015272           9190    9195#
00210   015314           9221    9226#
00211   015342           9254    9259#
00212   015370           9287    9292#
00213   015416           9319    9324#
00214   015442           9351    9356#
00215   015466           9384    9389#
00216   015512           9417    9422#
00217   015536           9449    9454#
00220   015560           9480    9485#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

00221	015606	9513	9518#
00222	015632	9545	9550#
00223	015656	9577	9582#
00224	015734	9622	9627#
00225	015772	9657	9662#
00226	016050	9703	9708#
00227	016110	9739	9744#
00230	016250	9815	9820#
00231	016306	9850	9855#
00232	016362	9895	9900#
00233	016422	9931	9936#
00234	016514	9981	9986#
00235	016574	10028	10033#
00236	016736	10105	10110#
00237	017016	10152	10157#
00240	017072	10198	10203#
00241	017152	10244	10249#
00242	017232	10290	10295#
00243	017310	10336	10341#
00244	017364	10382	10387#
00245	017444	10428	10433#
00246	017524	10474	10479#
00247	017602	10520	10525#
00250	017662	10566	10571#
00251	017740	10611	10616#
00252	020020	10656	10661#
00253	020076	10701	10706#
00254	020156	10746	10751#
00255	020236	10791	10796#
00256	020320	10836	10842#
00257	020400	10882	10888#
00260	020462	10928	10934#
00261	020542	10974	10980#
00262	020624	11020	11026#
00263	020706	11066	11072#
00264	020774	11114	11120#
00265	021052	11156	11162#
00266	021144	11204	11210#
00267	021224	11246	11252#
00270	021316	11294	11300#
00271	021376	11336	11342#
00272	021464	11383	11389#
00273	021540	11424	11430#
00274	021626	11471	11476#
00275	021704	11515	11520#
00276	021762	11558	11563#
00277	022036	11600	11605#
00300	022116	11643	11648#
00301	022174	11687	11692#
00302	022252	11730	11735#
00303	022332	11773	11778#
00304	022410	11816	11821#
00305	022470	11859	11864#
00306	022544	11901	11906#
00307	022622	11944	11949#
00310	022702	11987	11992#

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

00311	022756	12030	12035#
00312	023036	12074	12079#
00313	023116	12118	12123#
00314	023172	12162	12167#
00315	023252	12205	12210#
00316	023330	12248	12253#
00317	023410	12290	12295#
00320	023466	12333	12338#
00321	023546	12376	12381#
00322	023626	12419	12424#
00323	023704	12461	12466#
00324	023762	12505	12511#
00325	024044	12552	12558#
00326	024124	12596	12602#
00327	024214	12645	12651#
00330	024276	12689	12695#
00331	024356	12734	12740#
00332	024436	12778	12784#
00333	024520	12822	12828#
00334	024612	12869	12875#
00335	024674	12913	12919#
00336	024752	12956	12962#
00337	025032	13000	13006#
00340	025114	13044	13050#
00341	025172	13088	13094#
00342	025254	13132	13138#
00343	025336	13176	13182#
00344	025414	13220	13226#
00345	025476	13264	13270#
00346	025556	13308	13314#
00347	025640	13351	13357#
00350	025720	13395	13401#
00351	026002	13439	13445#
00352	026064	13483	13489#
00353	026144	13526	13532#
00354	026224	13572	13577#
00355	026304	13616	13621#
00356	026364	13661	13666#
00357	026444	13705	13710#
00360	026524	13749	13754#
00361	026610	13792	13798#
00362	026662	13830	13836#
00363	026742	13872	13878#
00364	027010	13908	13914#
00365	027074	13951	13957#
00366	027146	13988	13994#
00367	027226	14030	14036#
00370	027274	14066	14072#
00371	027356	14111	14116#
00372	027442	14155	14160#
00373	027520	14196	14201#
00374	027610	14241	14246#
00375	027674	14284	14289#
00376	027752	14326	14331#
00377	030036	14369	14374#
00400	030104	14405	14410#

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

00401	030156	14442	14447#
00402	030224	14478	14484#
00403	030272	14515	14521#
00404	030364	14562	14567#
00405	030456	14608	14613#
00406	030552	14654	14659#
00407	030646	14700	14705#
00410	030740	14746	14751#
00411	031032	14792	14797#
00412	031126	14838	14843#
00413	031222	14884	14889#
00414	031276	14922	14928#
00415	031352	14961	14967#
00416	031424	15000	15006#
00417	031476	15039	15045#
00420	031552	15083	15088#
00421	031632	15128	15133#
00422	031716	15173	15178#
00423	032002	15218	15223#
00424	032062	15263	15269#
00425	032146	15309	15315#
00426	032234	15355	15361#
00427	032322	15401	15407#
00430	032402	15450	15455#
00431	032462	15498	15503#
00432	032546	15546	15551#
00433	032632	15594	15599#
00434	032716	15642	15647#
00435	033002	15688	15694#
00436	033066	15733	15739#
00437	033152	15777	15783#
00440	033234	15822	15827#
00441	033314	15866	15871#
00442	033402	15910	15915#
00443	033474	15955	15961#
00444	033602	16006	16012#
00445	033662	16049	16054#
00446	033744	16092	16097#
00447	034024	16135	16140#
00450	034106	16178	16183#
00451	034160	16215	16221#
00452	034232	16253	16259#
00453	034322	16301	16308#
00454	034412	16350	16357#
00455	034502	16398	16405#
00456	034572	16447	16454#
00457	034674	16502	16509#
00460	034776	16557	16564#
00461	035100	16612	16619#
00462	035202	16667	16674#
00463	035306	16722	16729#
00464	035412	16778	16785#
00465	035516	16833	16840#
00466	035622	16889	16896#
00467	035724	16944	16951#
00470	036026	16999	17006#

00471	036130	17054	17061#
00472	036232	17109	17116#
00473	036336	17164	17171#
00474	036442	17220	17227#
00475	036546	17275	17282#
00476	036652	17331	17338#
00477	036746	17381	17388#
00500	037042	17431	17438#
00501	037136	17481	17488#
00502	037232	17531	17538#
00503	037326	17581	17588#
00504	037434	17634	17641#
00505	037530	17684	17691#
00506	037624	17734	17741#
00507	037666	17772	17778#
00510	037730	17809	17815#
00511	037774	17846	17852#
00512	040040	17884	17890#
00513	040104	17921	17927#
00514	040152	17960	17966#
00515	040234	18005	18010#
00516	040316	18052	18057#
00517	040362	18090	18095#
00520	040430	18125	18130#
00521	040506	18168	18173#
00522	040564	18209	18214#
00523	040632	18246	18252#
00524	040714	18292	18297#
00525	041000	18336	18343#
00526	041062	18382	18388#
00527	041146	18427	18433#
00530	041222	18466	18472#
00531	041276	18505	18511#
00532	041346	18545	18551#
00533	041416	18583	18589#
00534	041470	18621	18627#
00535	041542	18659	18665#
00536	041616	18698	18704#
00537	041702	18743	18748#
00540	041760	18787	18792#
00541	042044	18831	18836#
00542	042122	18875	18880#
00543	042210	18920	18926#
00544	042304	18969	18974#
00545	042366	19014	19019#
00546	042450	19059	19064#
00547	042532	19103	19108#
00550	042620	19147	19153#
00551	042700	19192	19198#
00552	042766	19237	19243#
00553	043046	19282	19288#
00554	043134	19327	19333#
00555	043222	19372	19377#
00556	043310	19417	19423#
00557	043374	19463	19469#
00560	043460	19508	19514#

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

00561	043544	19553	19558#			
00562	043624	19597	19602#			
00563	043714	19642	19647#			
00564	043774	19686	19691#			
00565	044056	19730	19735#			
00566	044140	19774	19778#			
00567	044222	19818	19823#			
00570	044304	19863	19868#			
00571	044372	19908	19913#			
00572	044460	19952	19958#			
00573	044546	19997	20003#			
00574	044640	20043	20049#			
00575	044732	20089	20095#			
00576	045024	20135	20141#			
00577	045116	20181	20187#			
00600	045206	20228	20234#			
00601	045300	20275	20281#			
00602	045370	20321	20327#			
00603	045434	20361	20366#			
00604	045514	20402	20408#			
00605	045564	20441	20447#			
00606	045636	20480	20486#			
00607	045710	20519	20525#			
00610	045762	20558	20564#			
00611	046036	20597	20603#			
00612	046112	20636	20642#			
00613	046156	20673	20679#			
00614	046230	20711	20717#			
00615	046274	20747	20753#			
00616	046346	20786	20792#			
00617	046412	20821	20826	20831#		
00620	046456	20862	20867	20872#		
00621	046534	20902	20913	20918#		
00622	046600	20949	20954	20959#		
00623	046666	20990	21001	21005	21012#	
00624	046742	21043	21048	21052	21058#	
00625	047030	21088	21093	21104	21109#	
00626	047074	21140	21145	21150#		
00627	047162	21181	21192	21196	21201#	
00630	047236	21232	21237	21241	21247#	
00631	047312	21278	21283	21287	21293#	
00632	047366	21324	21329	21333	21339#	
00633	047452	21370	21374	21379	21383	21390#
00634	047536	21421	21425	21430	21434	21441#
00635	047604	21473	21480#			
00636	047672	21525#				
00637	047740	21565#				
00640	050006	21602#				
00641	050056	21636	21644#			
00642	050136	21677	21690#			
00643	050214	21727	21735#			
00644	050306	21771	21784#			
00645	050360	21817	21825#			
00646	050442	21859	21872#			
00647	050474	21901	21906#			
00650	050554	21945	21949	21952#		

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
00651   050612          21983   21988#
00652   050650          22020   22025#
00653   050706          22057   22062#
00654   050744          22094   22099#
00655   051052          22150   22158#
00656   051160          22208   22216#
00657   051262          22262   22270#
00660   051366          22316   22324#
00661   051524          22358   22366   22385   22397#
00662   051662          22430   22438   22457   22469#
00663   051750          22477   22495#
00664   052014          22504   22511   22517#
00665   052062          22526   22533   22539#
00666   052200          22547   22572#
00667   052322          22582   22608#
00670   052436          22659#
00671   052552          22710#
00672   052756          22786#
00673   053162          22863#
00674   053304          22874   22899#
00675   053426          22908   22933#
00676   053550          22942   22967#
00677   053672          22976   23001#
00700   054014          23010   23035#
00701   054136          23044   23069#
00702   054252          23101#
00703   054366          23133#
00704   054514          23168#
00705   054630          23200#
00706   054754          23208   23234#
00707   055100          23243   23269#
00710   055216          23302#
00711   055334          23335#
00712   055452          23368#
00713   055570          23401#
00714   055736          23416   23452#
00715   056244          23465   23539#
00716   056310          23564#
00717   056436          23621#
00720   056544          23674#
00721   056624          23699#
00722   056704          23724#
00723   056764          23749#
00724   057046          23787#
00725   057162          23825   23830#
00726   057276          23867   23872#
00727   057446          23912   23931#
00730   057620          23983   23992#
00731   057772          24044   24053#
00732   060056          24083#
00733   060156          24116#
00734   060256          24149#
00735   060334          24186#
00736   060412          24224#
00737   060470          24260#
00740   060570          24307#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
00741   060674          24348   24362#
00742   061002          24402   24416#
00743   061120          24442   24457   24471#
00744   061212          24514#
00745   061302          24558#
00746   061366          24582   24602#
00747   061454          24626   24646#
00750   061542          24670   24690#
00751   061630          24713   24733#
00752   061706          24775#
00753   061774          24799   24819#
00754   062052          24861#
00755   062150          24911#
00756   062214          24947#
00757   062260          24984#
00760   062320          25019#
00761   062360          25055#
00762   062424          25093#
00763   062470          25131#
00764   062530          25166#
00765   062570          25201#
00766   062630          25237#
00767   062674          25274#
00770   062734          25309#
00771   063000          25347#
00772   063040          25383#
00773   063100          25418#
00774   063140          25453#
00775   063204          25491#
00776   063250          25529#
00777   063314          25566#
01000   063354          25601#
01001   063414          25636#
01002   063452          25670#
01003   063510          25704#
01004   063554          25740#
01005   063634          25780#
01006   063706          25812   25819#
01007   063770          25866#
01010   064046          25917   25938#
01011   064124          25986   26007#
01012   064202          26059   26080#
01013   064260          26129   26150#
01014   064324          26202   26205   26209#
01015   064370          26254   26257   26261#
PASCNT  066670          26270*  26275   26858   26966#
PC    =%000007           2700*   2905*   5561*   7334*   7369*   8029*  24066*  25735*  26269*  26276*  26282*  26288*  26304*
                        26357*  26369*  26457*  26528*  26659*  26664*  26670*  26675*  26680*  26685*  26691*  26696*  26725*
                        26728*  26742*  26760*  26761*  26804*  26810*  26818*  26832*  26851*  26865*  26866*  26867*  26868*
                        26869*  26874*  26887*  26900*  26914*  26929*  26942*
PDWN    064706          8020    26375#  26389
PFCNT   066672          26285   26287   26377*  26967#
PFMESS  067163          26290   27016#
PFMSG   067440          26394   27047#
PFRET   064524          26297#  26395   26466   26537
PRIFLG  066674           7682*   7687*  26297   26790*  26968#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

```
PRINA   066042          7680   26790#
PRINT   066050          8018   26794#
PSW   = 177776          2910#   3291    3319    3355    3386    3501*   3529    3570    3574    3603    3631    3744    3745*
                        3783    3784*   3820    3821*   3944    3974    4289*   4318*   4346    7404*   7412    7416*   7450*
                        7455    7459*   7489*   7497    7501*   7508*   7515*   7583*   7591    7595*   7602*   7609*   7639*
                        7644    7647*   8030*   8388    8392*   8428    8432*   9465    8469*   8505    8509*   22243*  22252
                       22297*  22306   22373   22445   22554*  22590*  22606*  22634*  22640   22656*  22685*  22691   22707*
                       22748*  22754*  22781*  22825*  22831*  22858*  22881*  22897*  22915*  22931*  22949*  22965*  22983*
                       22999*  23017*  23033*  23051*  23067*  23083*  23099*  23115*  23131*  23150*  23166*  23182*  23198*
                       23215*  23232*  23250*  23267*  23283*  23300*  23316*  23333*  23349*  23366*  23382*  23399*  23424*
                       23434*  23474*  23495*  23533*  26384*
PUP     064746          26375   26384#
RCSR  = 177560           2945#   7835    7968
RDBR  = 177562           2946#
RESTR   066166          26760   26844#
RETURN  066654           8031*  24868*  26570   26584*  26960#
RSERR   065050           7766   26448#
RSMSG   067520          26454   27056#
RSVFLG  066712           7754*   7760*  26445*  26975#
RSVTST  065042           7751   26445#
RD    =%000000           2898#   3112*   3137*   3140    3166*   3169*   3199*   3202*   3203*   3229*   3232*   3234*   3258*
                        3259*   3262*   3264*   3265*   3291*   3294*   3319*   3322*   3329    3355*   3358*   3386*   3387*
                        3390*   3400*   3401*   3425*   3430*   3437*   3461*   3462*   3466*   3473*   3474*   3529*   3531*
                        3534*   3544*   3545*   3570*   3571*   3658*   3661    3687*   3690    3715*   3718    3744*   3749
                        3756*   3757*   3783*   3788    3795*   3796*   3820*   3825    3832*   3833*   3857*   3858    3861
                        3886*   3890    3915*   3919    3944*   3945*   3949    3974*   3975*   3979    3987*   3988*   4013*
                        4017*   4019    4043*   4044*   4045    4048*   4050    4075*   4078*   4080    4103*   4107*   4109
                        4119*   4120    4131*   4132*   4133*   4134*   4135*   4136*   4181*   4207*   4235*   4260*   4288*
                        4317*   4344*   4378*   4411*   4443*   4480*   4517*   4550*   4586*   4621*   4663*   4664*   4666
                        4697*   4698*   4737*   4738*   4776*   4777*   4814*   4815*   4860*   4861*   4895*   4896*   4929*
                        4930*   4962*   4963*   4996*   4997*   5031*   5032*   5069*   5070*   5106*   5107*   5144*   5145*
                        5182*   5183*   5220*   5221*   5260*   5261*   5302*   5303*   5341*   5342*   5380*   5381*   5413*
                        5414*   5448*   5449*   5483*   5484*   5523*   5524*   5556*   5557*   5586*   5587*   5620*   5621*
                        5654*   5655*   5696*   5697*   5737*   5738*   5772*   5773*   5812*   5813*   5852*   5853*   5885*
                        5886*   5922*   5923*   5965*   5966*   6005*   6006*   6039*   6040*   6072*   6073*   6104*   6105*
                        6138*   6139*   6172*   6173*   6207*   6208*   6247*   6248*   6280*   6281*   6319*   6320*   6354*
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                        7483*   7539*   7540*   7576*   7577*   7633*   7634*   7673*   7674*   7712*   7713*   7747*   7748*
                        7788*   7789*   7826*   7827*   7869*   7870*   7905*   7906*   7938*   7939*   7966*   7967*   8051*
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                        8535*   8566*   8597*   8630*   8662*   8694*   8726*   8758*   8791*   8824*   8860*   8891*   8923*
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                        9378*   9411*   9443*   9475*   9506*   9539*   9571*   9603*   9648*   9683*   9729*   9767*   9841*
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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                    16861*  16916*  16971*  17026*  17081*  17136*  17192*  17247*  17303*  17359*  17409*  17459*  17509*
                    17559*  17609*  17662*  17712*  17761*  17764   17769   17798*  17801   17806   17835*  17838   17843
                    17873*  17876   17881   17910*  17913   17918   17949*  17952   17957   17985*  18031*  18078*  18114*
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                    18686*  18723*  18767*  18811*  18855*  18900*  18946*  18994*  19039*  19084*  19127*  19172*  19217*
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                    19843*  19888*  19932*  19977*  20022*  20068*  20114*  20160*  20207*  20254*  20301*  20350*  20388*
                    20429*  20468*  20507*  20546*  20585*  20624*  20662*  20699*  20736*  20774*  20811*  20852*  20878*
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                    24007   24017   24027   24037   24059*  24089*  24122*  24168*  24206*  24243*  24280*  24290   24331*
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                    26356   26365   26367*  26567*  26576   26674   26749*  26758*  26794   26795*  26798   26802*  26831
                    26845*
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R0002   003060       4208#   4215
R0003   003076       4236#   4241
R0004   003112       4261#   4268
R0005   003130       4289#   4297
R0006   003152       4318#   4324
R0007   003206       4348#   4358
R0010   003242       4381#   4390
R0011   003300       4414#   4423
R0012   003336       4446#   4454    4460
R0013   003376       4483#   4491    4497
R0014   003440       4520#   4530
R0015   003474       4553#   4563
R0016   003536       4590#   4600
R0017   003604       4625#   4635
R0020   003702       4669#   4678
R0021   003744       4701#   4710    4716
R0022   004016       4741#   4749    4756
R0023   004066       4780#   4788    4794
R0024   004136       4818#   4826    4832    4840
R0025   004222       4865#   4875
R0026   004266       4899#   4909
R0027   004332       4933#   4942
R0030   004374       4966#   4976
R0031   004436       5000#   5011
R0032   004510       5035#   5043    5049
R0033   004560       5073#   5081    5087
R0034   004630       5110#   5118    5124
R0035   004700       5148#   5156    5162
R0036   004750       5186#   5193    5201
R0037   005024       5225#   5232    5240
R0040   005106       5267#   5274    5282
R0041   005160       5306#   5313    5321
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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R0045	005422	5452#	5463			
R0046	005470	5487#	5497	5503		
R0047	005546	5527#	5536			
R0050	005604	5558#	5564			
R0051	005646	5590#	5600			
R0052	005716	5625#	5634			
R0053	005760	5658#	5669	5675		
R0054	006036	5700#	5711	5717		
R0055	006122	5742#	5752			
R0056	006166	5776#	5787	5793		
R0057	006250	5816#	5826	5832		
R0060	006332	5857#	5866			
R0061	006406	5892#	5901			
R0062	006454	5927#	5938	5944		
R0063	006536	5969#	5978	5985		
R0064	006612	6009#	6018			
R0065	006654	6043#	6051			
R0066	006716	6076#	6084			
R0067	006760	6108#	6118			
R0070	007026	6142#	6152			
R0071	007076	6176#	6186			
R0072	007140	6211#	6225			
R0073	007222	6251#	6259			
R0074	007262	6284#	6292	6299		
R0075	007336	6323#	6333			
R0076	007404	6358#	6369			
R0077	007472	6399#	6409	6415	6422	
R0100	007560	6446#	6455	6461	6467	6475
R0101	007662	6500#	6509	6515	6521	6529
R0102	007766	6554#	6563	6569	6575	6583
R0103	010072	6608#	6617	6623	6629	6637
R0104	010200	6664#	6675	6681		
R0105	010270	6707#	6718	6724		
R0106	010360	6750#	6761	6767		
R0107	010450	6792#	6803	6809		
R0110	010540	6834#	6845	6851		
R0111	010626	6877#	6888	6894		
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R0113	011004	6962#	6973	6979		
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R0115	011146	7045#	7055	7061		
R0116	011222	7086#	7099	7106	7112	
R0117	011322	7141#	7154	7161	7167	
R0120	011430	7194#	7204			
R0121	011502	7228#	7238			
R0122	011554	7262#	7272			
R0123	011626	7297#	7307			
R0124	011666	7330#	7337	7343		
R0125	011730	7366#	7372	7378		
R0126	011772	7401#	7410	7418	7424	
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R0131	012276	7542#	7554			

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R0133   012502          7636#   7649
R0134   012576          7679#   7691
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R0136   012742          7753#
R0137   013036          7794#
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R0142   013264          7909#   7918
R0143   013324          7942#   7951
R0145   013654          8053#   8062
R0146   013706          8088#   8093    8098    8103    8108
R0147   013752          8134#   8140
R0150   013776          8166#   8169
R0151   014020          8193#   8199
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R0153   014066          8256#   8262
R0154   014112          8290#   8295
R0155   014134          8321#   8327
R0156   014160          8353#   8358
R0157   014202          8384#   8395
R0160   014242          8421#   8426    8435
R0161   014306          8461#   8472
R0162   014344          8498#   8503    8512
R0163   014406          8538#   8543
R0164   014430          8569#   8576
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R0170   014554          8697#   8703
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R0172   014624          8761#   8768
R0173   014652          8794#   8801
R0174   014712          8830#   8837
R0175   014740          8863#   8870
R0176   014766          8894#   8899
R0177   015010          8926#   8933
R0200   015036          8959#   8966
R0201   015064          8992#   8999
R0202   015112          9024#   9030
R0203   015136          9057#   9063
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R0205   015206          9121#   9127
R0206   015232          9154#   9160
R0207   015256          9186#   9193
R0210   015304          9219#   9224
R0211   015326          9250#   9257
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R0221   015572          9509#   9516
R0222   015620          9542#   9548
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

R0223 015644 9574# 9580
R0224 015676 9607# 9619 9625
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R0226 016014 9688# 9699 9706
R0227 016072 9734# 9742
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R0233 016404 9926# 9934
R0234 016456 9966# 9978 9984
R0235 016536 10013# 10025 10031
R0237 016760 10137# 10149 10155
R0240 017036 10183# 10195 10201
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R0242 017174 10275# 10287 10293
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R0244 017330 10367# 10379 10385
R0245 017406 10413# 10425 10431
R0246 017466 10459# 10471 10477
R0247 017546 10505# 10517 10523
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R0254 020120 10731# 10743 10749
R0255 020200 10776# 10788 10794
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R0257 020340 10867# 10879 10886
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R0262 020564 11005# 11017 11024
R0263 020646 11051# 11063 11070
R0264 020730 11096# 11105 11111 11118
R0265 021016 11143# 11153 11160
R0266 021100 11186# 11195 11201 11208
R0267 021172 11234# 11243 11250
R0270 021252 11276# 11285 11291 11298
R0271 021344 11324# 11333 11340
R0272 021420 11365# 11374 11380 11387
R0273 021506 11412# 11421 11428
R0274 021572 11456# 11468 11474
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R0276 021724 11544# 11556 11561
R0277 022002 11587# 11598 11603
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R0301 022136 11673# 11685 11690
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R0303 022274 11759# 11771 11776
R0304 022352 11802# 11814 11819
R0305 022432 11845# 11857 11862
R0306 022512 11888# 11899 11904
R0307 022564 11930# 11942 11947
R0310 022644 11973# 11985 11990
R0311 022722 12016# 12028 12033
R0312 023000 12060# 12072 12077
R0313 023060 12104# 12116 12121
R0314 023136 12148# 12160 12165

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R0316   023272          12234#  12246   12251
R0317   023352          12276#  12288   12293
R0320   023430          12319#  12331   12336
R0321   023510          12362#  12374   12379
R0322   023570          12405#  12417   12422
R0323   023650          12447#  12459   12464
R0324   023724          12490#  12502   12509
R0325   024004          12537#  12549   12556
R0326   024064          12582#  12594   12600
R0327   024144          12626#  12637   12642   12649
R0330   024236          12675#  12687   12693
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R0334   024552          12855#  12867   12873
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R0340   025054          13030#  13042   13048
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R0342   025214          13118#  13130   13136
R0343   025276          13162#  13174   13180
R0344   025356          13206#  13218   13224
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R0352   026024          13469#  13481   13487
R0353   026106          13512#  13524   13530
R0354   026166          13557#  13569   13575
R0355   026246          13601#  13613   13619
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R0364   026764          13901#  13912
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R0370   027250          14059#  14070
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R0372   027404          14140#  14152   14158
R0373   027464          14183#  14193   14199
R0374   027554          14228#  14238   14244
R0375   027632          14270#  14281   14287
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R0377   027774          14355#  14366   14372
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R0401   030126          14434#  14445
R0402   030200          14471#  14482
R0403   030246          14508#  14519
R0404   030314          14545#  14558   14565
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

R0405	030406	14591#	14604	14611	
R0406	030500	14637#	14650	14657	
R0407	030574	14683#	14696	14703	
R0410	030670	14729#	14742	14749	
R0411	030762	14775#	14788	14795	
R0412	031054	14821#	14834	14841	
R0413	031150	14867#	14880	14887	
R0414	031244	14914#	14926		
R0415	031320	14953#	14965		
R0416	031374	14992#	15004		
R0417	031446	15031#	15043		
R0420	031516	15068#	15080	15086	
R0421	031576	15113#	15125	15131	
R0422	031660	15158#	15170	15176	
R0423	031744	15203#	15215	15221	
R0424	032024	15248#	15260	15267	
R0425	032106	15294#	15306	15313	
R0426	032174	15340#	15352	15359	
R0427	032262	15386#	15398	15405	
R0430	032342	15434#	15447	15453	
R0431	032422	15482#	15495	15501	
R0432	032504	15530#	15543	15549	
R0433	032570	15578#	15591	15597	
R0434	032654	15626#	15639	15645	
R0435	032744	15673#	15685	15692	
R0436	033026	15718#	15730	15737	
R0437	033114	15763#	15774	15781	
R0440	033200	15807#	15819	15825	
R0441	033260	15851#	15863	15869	
R0442	033342	15895#	15907	15913	
R0443	033430	15939#	15952	15959	
R0444	033534	15989#	16003	16010	
R0445	033624	16035#	16046	16052	
R0446	033704	16078#	16089	16095	
R0447	033766	16121#	16132	16138	
R0450	034046	16164#	16175	16181	
R0451	034130	16208#	16219		
R0452	034202	16246#	16257		
R0453	034260	16285#	16298	16306	
R0454	034350	16334#	16347	16355	
R0455	034436	16381#	16395	16403	
R0456	034526	16430#	16444	16452	
R0457	034620	16480#	16493	16499	16507
R0460	034722	16535#	16548	16554	16562
R0461	035022	16589#	16603	16609	16617
R0462	035124	16644#	16658	16664	16672
R0463	035230	16700#	16713	16719	16727
R0464	035334	16756#	16769	16775	16783
R0465	035436	16810#	16824	16830	16838
R0466	035542	16866#	16880	16886	16894
R0467	035650	16922#	16935	16941	16949
R0470	035752	16977#	16990	16996	17004
R0471	036052	17031#	17045	17051	17059
R0472	036154	17086#	17100	17106	17114
R0473	036260	17142#	17155	17161	17169
R0474	036364	17198#	17211	17217	17225

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

R0475	036466	17252#	17266	17272	17280
R0476	036572	17308#	17322	17328	17336
R0477	036700	17365#	17378	17386	
R0500	036774	17415#	17428	17436	
R0501	037066	17464#	17478	17486	
R0502	037162	17514#	17528	17536	
R0503	037260	17565#	17578	17586	
R0504	037366	17618#	17631	17639	
R0505	037460	17667#	17681	17689	
R0506	037554	17717#	17731	17739	
R0507	037644	17765#	17776		
R0510	037706	17802#	17813		
R0511	037750	17839#	17850		
R0512	040014	17877#	17888		
R0513	040060	17914#	17925		
R0514	040130	17954#	17964		
R0515	040200	17990#	18002	18008	
R0516	040260	18036#	18049	18055	
R0517	040342	18083#	18093		
R0520	040410	18119#	18128		
R0521	040452	18155#	18165	18171	
R0522	040526	18196#	18206	18212	
R0523	040612	18240#	18250		
R0524	040660	18278#	18289	18295	
R0525	040742	18323#	18333	18340	
R0526	041026	18369#	18379	18386	
R0527	041110	18414#	18424	18431	
R0530	041174	18459#	18470		
R0531	041250	18498#	18509		
R0532	041324	18538#	18549		
R0533	041374	18576#	18587		
R0534	041444	18614#	18625		
R0535	041516	18652#	18663		
R0536	041570	18691#	18702		
R0537	041644	18728#	18740	18746	
R0540	041724	18772#	18784	18790	
R0541	042006	18816#	18828	18834	
R0542	042066	18860#	18872	18878	
R0543	042150	18905#	18917	18924	
R0544	042250	18954#	18966	18972	
R0545	042330	18999#	19011	19017	
R0546	042414	19044#	19056	19062	
R0547	042476	19089#	19100	19106	
R0550	042560	19132#	19144	19151	
R0551	042642	19177#	19189	19196	
R0552	042726	19222#	19234	19241	
R0553	043010	19267#	19279	19286	
R0554	043074	19312#	19324	19331	
R0555	043162	19357#	19369	19376	
R0556	043250	19402#	19414	19421	
R0557	043334	19448#	19460	19467	
R0560	043422	19494#	19505	19512	
R0561	043506	19538#	19550	19556	
R0562	043570	19582#	19594	19600	
R0563	043652	19626#	19639	19645	
R0564	043740	19671#	19683	19689	

DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

R0565	044022	19715#	19727	19733		
R0566	044104	19759#	19771	19777		
R0567	044166	19803#	19815	19821		
R0570	044250	19848#	19860	19866		
R0571	044332	19893#	19905	19911		
R0572	044420	19937#	19949	19956		
R0573	044506	19982#	19994	20001		
R0574	044574	20027#	20040	20047		
R0575	044666	20073#	20086	20093		
R0576	044760	20119#	20132	20139		
R0577	045052	20165#	20178	20185		
R0600	045144	20212#	20225	20232		
R0601	045234	20259#	20272	20279		
R0602	045326	20306#	20318	20325		
R0603	045412	20354#	20364			
R0604	045470	20395#	20406			
R0605	045536	20433#	20445			
R0606	045606	20472#	20484			
R0607	045660	20511#	20523			
R0610	045732	20550#	20562			
R0611	046004	20589#	20601			
R0612	046060	20628#	20640			
R0613	046134	20666#	20677			
R0614	046204	20704#	20715			
R0615	046252	20740#	20751			
R0616	046316	20778#	20790			
R0617	046360	20814#	20820	20829		
R0620	046424	20855#	20861	20870		
R0621	046470	20895#	20901	20910	20916	
R0622	046546	20942#	20948	20957		
R0623	046612	20983#	20989	20998	21004	21008
R0624	046700	21036#	21042	21051	21056	
R0625	046754	21081#	21087	21092	21101	21107
R0626	047042	21133#	21139	21148		
R0627	047106	21174#	21180	21189	21195	21199
R0630	047174	21225#	21231	21240	21245	
R0631	047250	21271#	21277	21286	21290	
R0632	047324	21317#	21323	21332	21336	
R0633	047400	21363#	21369	21373	21382	21388
R0634	047464	21414#	21420	21424	21433	21439
R0635	047552	21463#	21469	21477		
R0636	047620	21502#	21510	21516	21522	
R0637	047706	21548#	21554	21562		
R0640	047754	21586#	21592	21599		
R0641	050022	21625#	21632	21640		
R0642	050072	21666#	21673	21681	21686	
R0643	050152	21712#	21719	21723	21731	
R0644	050242	21760#	21767	21775	21780	
R0645	050322	21806#	21813	21822		
R0646	050374	21847#	21855	21863	21868	
R0647	050454	21896#	21900			
R0650	050506	21930#	21948	21951		
R0651	050566	21975#	21986			
R0652	050624	22012#	22023			
R0653	050662	22049#	22060			
R0654	050720	22086#	22097			

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R0655   050760          22123#  22132   22141   22147   22155
R0656   051066          22181#  22190   22199   22205   22213
R0657   051174          22239#  22249   22259   22267
R0660   051276          22293#  22303   22313   22321
R0661   051406          22348#  22356   22364   22376   22383   22393
R0662   051544          22420#  22428   22436   22448   22455   22465
R0663   051710          22480#  22490
R0664   052000          22507#  22515
R0665   052044          22529#  22537
R0666   052114          22551#  22564
R0667   052226          22585#  22600
R0670   052346          22634#  22646   22654
R0671   052462          22685#  22697   22705
R0672   052572          22736#  22757   22765   22774   22778
R0673   052776          22813#  22834   22842   22851   22855
R0674   053224          22879#  22891
R0675   053346          22913#  22925
R0676   053470          22947#  22959
R0677   053612          22981#  22993
R0700   053734          23015#  23027
R0701   054056          23049#  23061
R0702   054172          23081#  23093
R0703   054306          23113#  23125
R0704   054434          23148#  23160
R0705   054550          23180#  23192
R0706   054672          23213#  23226
R0707   055016          23248#  23261
R0710   055134          23281#  23294
R0711   055252          23314#  23327
R0712   055370          23347#  23360
R0713   055506          23380#  23393
R0714   055632          23421#  23441   23446
R0715   056020          23473#  23504   23511   23518   23524   23530
R0716   056266          23553#  23559
R0717   056324          23589#  23601   23609   23616
R0720   056456          23645#  23655   23663   23670
R0721   056564          23683#  23694
R0722   056644          23708#  23719
R0723   056724          23733#  23744
R0724   057000          23771#  23781
R0732   060014          24063#  24070   24079
R0733   060112          24095#  24102   24111
R0734   060212          24128#  24135   24144
R0735   060272          24171#  24181
R0736   060350          24209#  24219
R0737   060426          24246#  24256
R0740   060504          24283#  24293   24301
R0741   060604          24334#  24347   24358
R0742   060710          24388#  24401   24412
R0743   061026          24443#  24456   24467
R0744   061162          24499#  24507   24511
R0745   061252          24543#  24551   24555
R0746   061336          24587#  24595   24599
R0747   061424          24631#  24639   24643
R0750   061512          24675#  24683   24687
R0751   061600          24718#  24726   24730
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R0752    061656          24760#  24768   24772
R0753    061744          24804#  24812   24816
R0754    062022          24846#  24854   24858
R0755    062124          24900#  24909
R0756    062164          24935#  24945
R0757    062230          24972#  24982
R0760    062274          25008#  25017
R0761    062334          25044#  25053
R0762    062374          25081#  25091
R0763    062440          25119#  25129
R0764    062504          25155#  25164
R0765    062544          25190#  25199
R0766    062604          25226#  25235
R0767    062650          25263#  25272
R0770    062710          25298#  25307
R0771    062754          25336#  25345
R0772    063014          25372#  25381
R0773    063054          25407#  25416
R0774    063114          25442#  25451
R0775    063160          25480#  25489
R0776    063224          25518#  25527
R0777    063270          25555#  25564
R1      =%000001          2899#   3426*   3427*   3430    3463*   3466    3530*   3534    3746*   3749    3785*   3788    3822*
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                          4014*   4017    4045*   4048    4074*   4078    4104*   4107    4120*   4121*   4122    4131    4157*
                          4158*   4159    4639*   4641*   4642    7749*   7790*   7874*   7880*   7976*   7980*   8052*   8086*
                          8132*   8164*   8191*   8223*   8254*   8288*   8319*   8351*   8382*   8419*   8459*   8496*   8536*
                          8567*   8598*   8631*   8663*   8695*   8727*   8759*   8792*   8825*   8861*   8892*   8924*   8957*
                          8990*   9022*   9055*   9087*   9119*   9152*   9184*   9217*   9248*   9281*   9313*   9346*   9379*
                          9412*   9444*   9476*   9507*   9540*   9572*   9604*   9649*   9684*   9730*   9768*   9793*   9842*
                          9877*   9922*   9959*  10009*  10058*  10082*  10133*  10179*  10225*  10271*  10317*  10363*  10409*
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                         11048*  11093*  11140*  11182*  11230*  11272*  11320*  11362*  11409*  11450*  11496*  11541*  11584*
                         11626*  11670*  11713*  11756*  11799*  11842*  11885*  11927*  11970*  12013*  12057*  12101*  12145*
                         12188*  12231*  12273*  12316*  12359*  12402*  12444*  12487*  12533*  12579*  12623*  12672*  12717*
                         12761*  12805*  12849*  12896*  12940*  12983*  13027*  13071*  13115*  13159*  13203*  13247*  13291*
                         13334*  13378*  13422*  13466*  13509*  13554*  13598*  13643*  13687*  13731*  13775*  13819*  13856*
                         13898*  13934*  13977*  14014*  14056*  14092*  14136*  14180*  14222*  14267*  14310*  14352*  14395*
                         14431*  14468*  14505*  14542*  14588*  14634*  14680*  14726*  14772*  14818*  14864*  14911*  14950*
                         14989*  15028*  15065*  15109*  15154*  15199*  15244*  15290*  15336*  15382*  15430*  15478*  15526*
                         15574*  15622*  15669*  15714*  15759*  15803*  15847*  15891*  15935*  15982*  16032*  16075*  16118*
                         16161*  16205*  16243*  16280*  16329*  16377*  16426*  16475*  16530*  16585*  16640*  16695*  16751*
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                         17510*  17560*  17610*  17663*  17713*  17762*  17799*  17836*  17874*  17911*  17950*  17986*  18032*
                         18079*  18115*  18152*  18193*  18236*  18274*  18319*  18365*  18410*  18455*  18494*  18534*  18572*
                         18610*  18648*  18687*  18724*  18768*  18812*  18856*  18901*  18947*  18995*  19040*  19085*  19128*
                         19173*  19218*  19263*  19308*  19353*  19398*  19444*  19490*  19534*  19578*  19622*  19667*  19711*
                         19755*  19799*  19844*  19889*  19933*  19978*  20023*  20069*  20115*  20161*  20208*  20255*  20302*
                         20351*  20389*  20430*  20469*  20508*  20547*  20586*  20625*  20663*  20700*  20737*  20775*  20812*
                         20853*  20893*  20940*  20981*  21034*  21080*  21131*  21172*  21223*  21269*  21315*  21361*  21412*
                         21461*  21500*  21546*  21584*  21623*  21664*  21710*  21755*  21804*  21845*  21894*  21928*  21973*
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                         22580*  22631*  22682*  22733*  22810*  22872*  22906*  22940*  22974*  23008*  23042*  23076*  23108*
                         23140*  23175*  23206*  23241*  23276*  23309*  23342*  23375*  23414*  23463*  23550*  23587*  23642*
                         23680*  23705*  23730*  23769*  23798*  23807*  23816*  23841*  23850*  23858*  23885*  23894*  23903*
                         23942*  23952*  23962*  23972*  24003*  24013*  24023*  24033*  24062*  24091*  24123*  24169*  24207*
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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                    24719   24728*  24729   24759*  24761   24770*  24771   24803*  24805   24814*  24815   24845*  24847
                    24856*  24857   24898*  24933*  24970*  25006*  25042*  25079*  25117*  25153*  25188*  25224*  25260*
                    25296*  25333*  25370*  25405*  25440*  25477*  25515*  25552*  25588*  25623*  25658*  25692*  25726*
                    25762*  25802*  25843*  25918*  25922   25987*  25991   26060*  26064   26130*  26134   26187*  26193
                    26204*  26239*  26245   26258*  26297*  26298*  26299   26347*  26365   26679   26746*  26753*  26755*
                    26830   26846*  26918*  26920
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R1001   063370      25625#  25634
R1002   063430      25660#  25668
R1003   063466      25694#  25702
R1004   063524      25728#  25738
R1005   063602      25767#  25778
R1006   063650      25804#  25811
R1007   063722      25845#  25862
R1010   064042      25930   25935#
R1011   064120      25999   26004#
R1012   064176      26072   26077#
R1013   064254      26142   26147#
R1014   064274      26190#  26200   26207
R1015   064340      26242#  26252   26259
R10230  016130       9772#   9784    9790
R10236  016616      10062#  10074   10080
R10725  057066      23797#  23804
R10726  057202      23840#  23847
R10727  057316      23884#  23891
R10730  057470      23942#  23950
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                     4714    4739*  4741*  4751   4754    4778*  4780*  4783    4790    4816*  4828    4834   4837
                     4839*   4862*  4865*  4870   4873    4897*  4899*  4904    4907    4931*  4965*  4966*  4971
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                     5671    5699*  5701*  5706   5709    5713   5739*  5742*  5747    5750   5774*  5777*  5782
                     5785    5814*  5854*  5889*  5925*   5928*  5933   5936    5967*  5970*  5980    5983   6007*
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

10319* 10365* 10367* 10371* 10381 10411* 10413* 10427 10457* 10459* 10463* 10473 10503*
10505* 10509* 10519 10549* 10594* 10639* 10684* 10729* 10774* 10819* 10821* 10825* 10835
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11928* 11971* 12014* 12058* 12102* 12146* 12189* 12232* 12274* 12317* 12360* 12403* 12445*
12488* 12490* 12494 12504 12507 12534* 12537* 12541 12551 12554 12580* 12582* 12586*
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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E10


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SW10  = 002000          2919#  26572   26700
SW11  = 004000          2918#  26579
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SW14  = 040000          2915#  26568
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F10


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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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T1011   064050          25982#
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DBQEAB.CMB CROSS REFERENCE TABLE -- USER SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- MACRO NAMES

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DBQEAB.CMB CROSS REFERENCE TABLE -- MACRO NAMES

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E11

DBQEA8.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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       14642 14688 14734 14780 14826 14872 14919 14958 14997 15036 23827 23869 23920 23924 23986
       24047 25126 25232 25922 26193 26245 26402 26718 26796 26885 26898 26912 26927 26940
ASH    26920
ASL     5038  5076 11934 11977 12020 12990 13034 13078 26747 26751
ASRB   11280 11328 11369 11416
BCC     3028  3086  5078  5153  8323  8355  8386  9657  9739  9850  9931  9975 10022 10071 10093
       10146 10192 10376 10560 10740 10830 11060 11150 11240 11330 11418 11465 11509 11553 11595
       11768 11854 11896 11982 12025 12113 12157 12200 12285 12328 12371 12414 12499 12546 12591
       12634 12817 12908 12951 13039 13083 13171 13215 13259 13346 13390 13434 13478 13610 13699
       13743 14149 15077 15167 15257 15349 15444 15492 15588 15636 15727 15771 15860 15904 16295
       16344 16490 16545 16710 16766 16932 16987 17152 17208 17375 17425 17575 17628 17999 18781
       18869 18963 19053 19097 19186 19276 19366 19411 19502 19591 19680 19768 19857 19902 19991
       20083 20129 20222 20315 20823 20904 20992 21095 21183 21280 21376 21559 21980 22054 22196
       22371
BCS     3057  3172  3206  3363  3395  3506  3539  5040  5115  8058  8105  8463  9616  9696  9781
       9803  9889 10238 10284 10330 10422 10468 10514 10605 10650 10695 10785 10876 10922 10968
       11014 11102 11192 11282 11371 11638 11682 11725 11811 11939 12069 12243 12456 12684 12729
       12773 12864 12995 13127 13303 13521 13566 13655 14105 15122 15212 15303 15395 15540 15682
       15816 15949 16000 16392 16441 16600 16655 16821 16877 17042 17097 17263 17319 17475 17525
       17678 17728 18046 18737 18825 18914 19008 19141 19231 19321 19457 19547 19636 19724 19812
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       22443
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      12333 12369 12376 12412 12419 12454 12461 12505 12544 12552 12596 12639 12645 12682 12689
      12734 12778 12815 12822 12851 12869 12906 12913 12949 12956 13000 13037 13044 13088 13125
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F11

DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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        18787   18823   18831   18875   18912   18920   18949   18969   19006   19014   19059   19095   19103   19139   19147
        19192   19229   19237   19282   19319   19327   19372   19417   19455   19463   19500   19508   19545   19553   19597
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        21935   21945   22019   22093   22144   22150   22194   22202   22208   22254   22262   22308   22316   22369   22379
        22388   22451   22460   22533   22560   22642   22649   22693   22700   22762   22769   22839   22846   23142   23439
        23501   23508   23605   23612   23659   24351   24405   24442   24460   24538   25764   25917   25925   25986   25994
        26059   26067   26129   26137   26197   26249   26286   26303   26350   26363   26366   26379   26463   26534   26569
        26573   26577   26641   26661   26666   26672   26677   26682   26688   26693   26703
BGE      8540    8572    8603    8636
BGT      8797    8833    8866    8896    8929    8962    8995    9027
BHI      9221    9253    9286    9318
BHIS     9480    9512
BIC      6145    6180    6216    8003    8004   18820   18864   19226   19271   19631   19675   20032   20078   22567   22569
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BLO      9544    9577
BLOS     9350    9384    9417    9449
BLT      8667    8700    8732    8764   26809
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       15442   15490   15725   15858   16390   16439   16598   16653   16819   16875   17040   17095   17261   17317   17473
       17523   17676   17726   18044   18779   18867   18961   19051   19184   19274   19364   19409   19589   19678   19766
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         4749    4756    4788    4794    4826    4832    4840    4875    4909    4942    4976    5011    5043    5049    5081
         5087    5118    5124    5156    5162    5193    5201    5232    5240    5274    5282    5313    5321    5358    5393
         5428    5463    5494    5497    5503    5536    5564    5600    5634    5669    5675    5711    5717    5752    5787
         5793    5826    5832    5866    5901    5938    5944    5978    5985    6018    6051    6084    6118    6152    6186
         6225    6259    6292    6299    6333    6369    6409    6415    6422    6455    6461    6467    6475    6509    6515
         6521    6529    6563    6569    6575    6583    6617    6623    6629    6637    6675    6681    6718    6724    6761
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        26926   26939
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        11724   11810   11895   12024   12156   12242   12284   12327   12413   12455   12498   12545   12590   12633   12683
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        15815   15859   15948   15999   16294   16343   16391   16440   16489   16544   16599   16654   16709   16765   16820
        16876   16931   16986   17041   17096   17151   17207   17262   17318   17374   17424   17474   17524   17574   17627
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CCC      3081    3110    3138    3167    3200    3230    3260    3356    3388    3428    3464    3499    3532    3601    3659
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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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        8894  8926  8959  8992  9024  9057  9089  9121  9154  9186  9219  9250  9283  9315  9348
        9321  9414  9446  9478  9509  9542  9574  9608  9654  9735  9773  9795  9847  9927  9967
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       12809 12856 12900 12944 12987 13031 13075 13119 13163 13207 13251 13295 13338 13382 13426
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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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J11

DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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DBQEAB.CMB CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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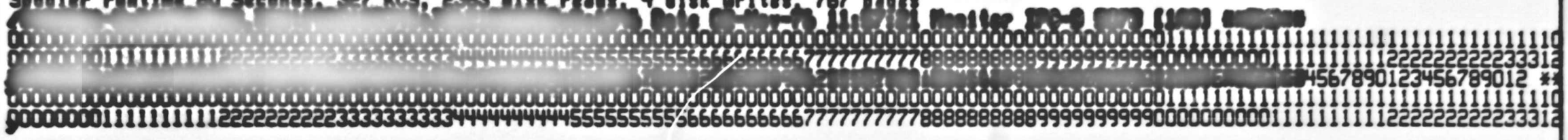
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